United States Department of Agriculture
Forest Service

Beasley Pond Analysis Area

Draft Environmental Impact Statement

Apalachicola Ranger District, Apalachicola National Forest, Liberty County, Florida

March 2015

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Draft Environmental Impact Statement

Liberty County, Florida

Lead Agency:	**USDA Forest Service**
Responsible Official:	**Marcus Beard, District Ranger** 57 Taff Drive Crawfordville, FL 32327
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Abstract: The U.S. Forest Service is preparing this Environmental Impact Statement (EIS) to evaluate the potential impacts associated with silvicultural treatments on approximately 3,700 acres of national forest land. Treatments include thinnings, uneven-aged management cuts, wet savanna restoration, woody species control, borrow pit excavation, and transportation system improvement. Based on interdisciplinary team meetings and public response the Forest Service identified several issues which resulted in the formulation of four alternatives:
Alternative A – No Action
Alternative B – Proposed Action (preferred alternative)
Alternative C – Reduced direct impacts on threatened and endangered species
Alternative D – No Herbicide
The responsible official will decide which alternative best meets the purpose and need identified during the planning process.

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Forest Service's preparation of the EIS. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review.

Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action (40 CFR 1502.10).

Send comments to:	**Marcus Beard, District Ranger** **57 Taff Drive** **Crawfordville, FL 32327**
Comments received by:	**April 20, 2015**

Summary

NEPA requires federal agencies to integrate environmental values in their decision-making processes by considering the environmental impacts of, and reasonable alternatives to, their Proposed Action. For major federal actions that have the potential to cause significant adverse impacts on the environment, NEPA requires the agency undertaking the action to prepare an EIS. Should the Preferred Alternative be selected the Forest Service has concluded that this project would constitute a major federal action that may significantly affect the quality of the natural and human environment. Therefore, the USFS has determined that this action requires the preparation of an EIS.

We are proposing to timber harvest and conduct ecological restoration activities on approximately 3,700 acres of forestland and wet savannas in Beasley Pond Analysis Area. The proposed actions would include treatments such as thinning of slash and longleaf pine stands, wet savanna restoration, uneven-aged management cuts, woody species control, borrow pit excavation, and removal of cattle guards associated with a closed cattle allotment. Other actions connected to the proposed action include landline maintenance, road maintenance, and road reconstruction. These actions are proposed to be implemented on the Apalachicola Ranger District of the Apalachicola National Forest. The area affected by the proposal includes compartments 25, 26, 27, 28 and 29 of the Apalachicola National Forest. The legal description of the analysis area consists of Sections 23, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35 of Township 3 South, Range 8 West and Sections 3, 4, 5 and 6 of Township 4 South and Range 8 West of Liberty County, Florida.

The National Forests in Florida's Forest Plan outlines several goals for the National Forests of Florida, including the conservation and protection of declining natural communities, and uncommon biological, ecological, or geological sites. The Beasley Pond Analysis area contains large areas of historical wet savanna habitat, multiple red-cockaded woodpecker (RCW) clusters, critical habitat for the frosted flatwoods salamander and recent records of two federally listed plant species that occur in open wet savanna habitats.

The following issues led the agency to develop alternatives to the proposed action:

- Timber harvest impacts on species listed as threatened or endangered under the federal Endangered Species Act.
- The use of herbicides is a highly controversial management activity with potential environmental and human health impacts.
- Wet savanna restoration treatments may negatively affect red-cockaded (RCW) habitat.

Based upon the effects of the alternatives, the responsible official will decide which management activities will be implemented to improve forest health and restore unique ecological communities.

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Document Structure

This Environmental Impact Statement (EIS) was prepared in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

- *Chapter 1. Purpose and Need for Action:* The chapter includes information on the history of the project proposal, the purpose and need for the project, and the Forest Service's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Chapter 2. Alternatives, including the Proposed Action:* The chapter provides a more detailed description of the Forest Service's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes any mitigation measures associated with the proposed action or alternatives. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Chapter 3. Affected Environmental and Environmental Consequences:* The chapter describes the environmental effects of implementing the proposed action and other alternatives. The analysis is organized by resource area.
- *Chapter 4. Consultation and Coordination:* The chapter provides a list of preparers and agencies consulted during the development of the EIS.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the EIS.

Additional documentation, including more detailed analyses of project area resources, may be found in the project record located at: The Wakulla Ranger District, 57 Taff Drive, Crawfordville, Florida 32327

Chapter 1. Purpose and Need

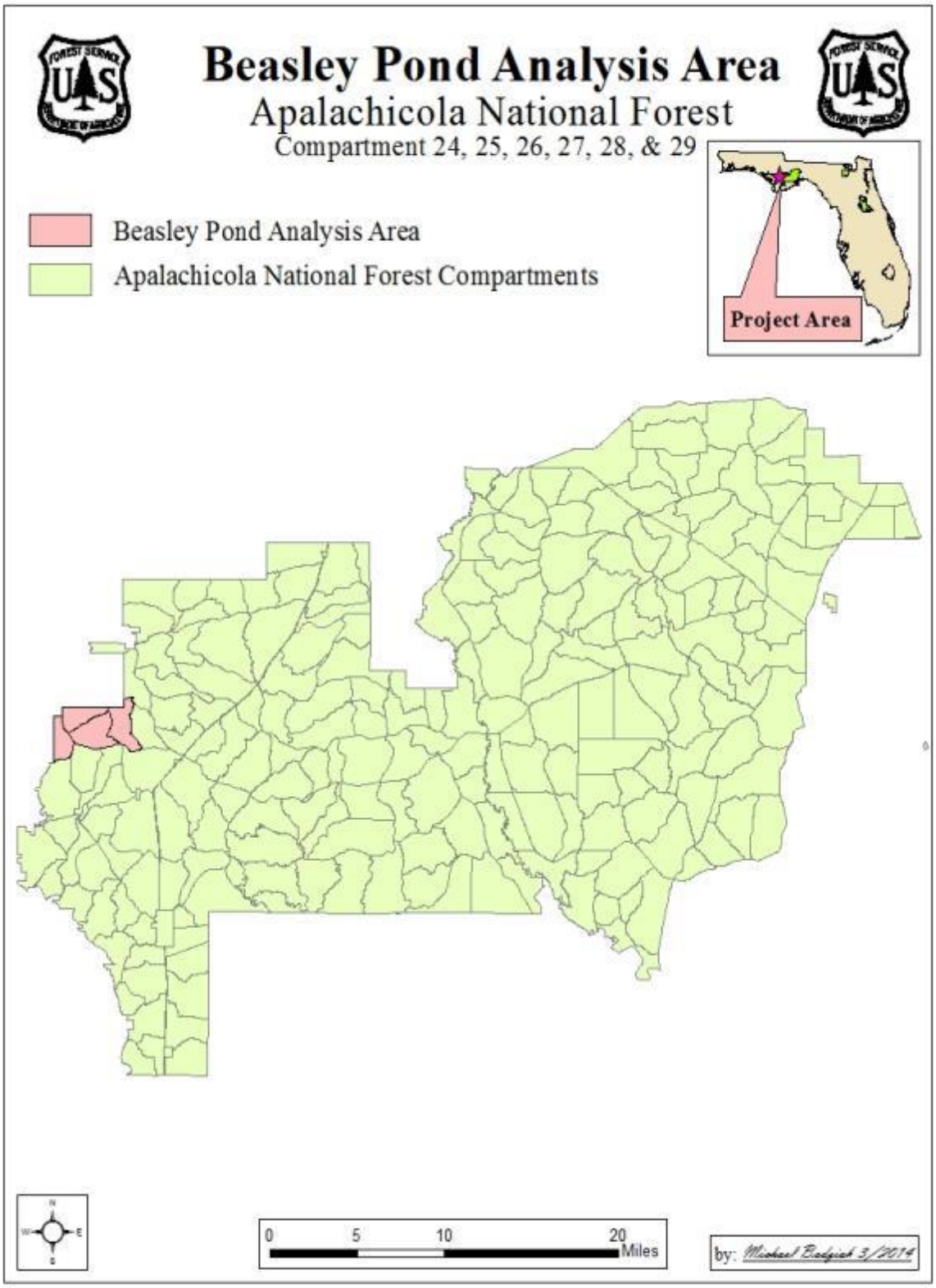
Background

The Beasley Pond Analysis Area was identified on the Apalachicola National Forest 5-Year Timber Sale Plan as an area in need of both ecosystem rehabilitation and maintenance. This analysis area falls within Management Areas (MA) 7.1 and 7.2. An interdisciplinary approach was used to evaluate areas and propose treatments to move the stands toward a desired future condition. These areas are predominantly longleaf and slash pine forests that are managed with a focus on maintaining or restoring ecosystem health. The analysis area is located between State Highways 379 and 65; just north of FSR 113 of the Apalachicola Ranger District.

Purpose and Need for Action

The Forest Plan outlines several goals for the National Forests of Florida, one of which calls for the conservation and protection of declining natural communities, and uncommon biological, ecological, or geological sites (USDA 1999b). The Beasley Pond Analysis area has been identified as containing overstocked stands and areas of wet prairies that are unique in both soil and plant characteristics. The primary purpose of this proposal is to maintain, improve, and restore a healthy forest ecosystem by: thinning both longleaf and slash pine stands to allow for further tree growth, restoring remnant wet savannas to improve habitat for a variety of plant species, and controlling overabundant woody plant species to restore herbaceous groundcover. Secondary benefits include maintaining and growing a stable red-cockaded woodpecker (RCW) habitat and improving the current transportation system. There is a need to move the analysis area from its existing condition, to the desired condition as identified in the forest plan for MA 7.1 and 7.2. This will be accomplished by reducing current stocking levels of stands within the project area to open the forest canopy and promote herbaceous groundcover growth and establishment. There also exists a need for rehabilitation and maintenance in declining natural wet savanna sites in the project area while maintaining a stable RCW population.

Figure 1. Project Area



Existing Condition

The Beasley Pond Analysis Area contains approximately 6,827 acres comprising all of compartments 25, 26, 27 and 28 as well as one stand in compartment 29. The Forest Plan designated the entire project area as either Management Area (MA) 7.1 or 7.2, both of which are RCW Habitat Management Areas that contain "predominantly longleaf and slash pine forests that are managed with a focus on an adaptive approach in maintaining or restoring ecosystem health" (USDA 1999b, p. 4.37-4.41). Management Area 7.2 also allows cattle grazing; however, the grazing allotment within this project area is unused and will be decommissioned so the primary difference between the two MAs is the remaining cattle guards and fences. Although the emphasis of both MAs is management for pine forest habitats, the desired conditions of both MA 7.1 and 7.2 describe a mosaic of plant communities, with vegetation structure and composition depending on hydrology, soil, prescribed fire and past management (USDA 1999b).

This project area includes a mix of mesic and wet flatwoods, pine plantations, wetlands and drainages, remnant wet savanna and small areas of sandhill in compartment 28. According to Forest Service vegetation surveys, stands of predominantly longleaf pine account for approximately 2,000 acres of the project area and predominantly slash pine stands account for approximately 2,450 acres of the project area. Pine stands range from 26 to 100+ years old, and many natural stands and plantations are overstocked with high tree density and basal areas (BA) averaging >100 ft^2/acre. Younger slash pine stands, most of which were planted 26-40 years ago, have a basal area between 70 and 173 ft^2/acre with an average of 111 ft^2/acre. Older slash pine stands (>40 years, many of which were also planted) have a BA between 42 and 141 ft^2/acre with an average BA of 108 ft^2/acre. Longleaf pine stands range from 25 to 140+ years old, and many have a higher density of trees than is desirable for open flatwoods habitats (average BA of 100 ft^2/acre). Typical forested wetland species such as black gum, cypress, red maple, titi and wax myrtle occur throughout the drainages and swamps of the project area (totaling approximately 2,000 acres). Except for encroachment of titi and other wetland shrubs into more open habitat due to insufficient frequency and intensity of fire, the lowlands and hardwood stringers along the watercourses are in good condition. Groundcover varies across the project area; many stands contain dense wiregrass and other desirable species and other stands contain more shrubs and lower herbaceous cover.

The Beasley Pond Analysis Area includes large areas of wet savanna, a rare and biologically diverse habitat characterized by sparse trees, frequent fire, a diverse grassy and herbaceous groundcover and seasonal inundation (Kushlan 1990). However, many wet savannas throughout the region have been lost to plantation silviculture and, in unplanted areas, alteration of fire regimes has also led to loss of wet prairies through encroachment of shrubs (particularly titi) and establishment of slash pine trees. Kindell (1997) provides greater detail on the interaction between historical land uses in the area and the maintenance of wet prairie habitats. The FEIS for the Forest Plan recognized the degradation of wet prairie habitats:

> Woody species are excluded from open savanna by the interacting effects of soil (clay lenses) and fire, but without fire, shrubs and trees will encroach. Some wet savannas were ditched and planted to slash pine several decades ago. This has affected their composition. Others have ditches and plowed firelines across them, which have altered

their hydrology. Many wet savannas have experienced some shrub encroachment from fire suppression, though the more recent prescribed burns have reduced encroachment (USDA 1999a, 3.28-3.29).

Figure 2. Edge of planted-over wet savanna site

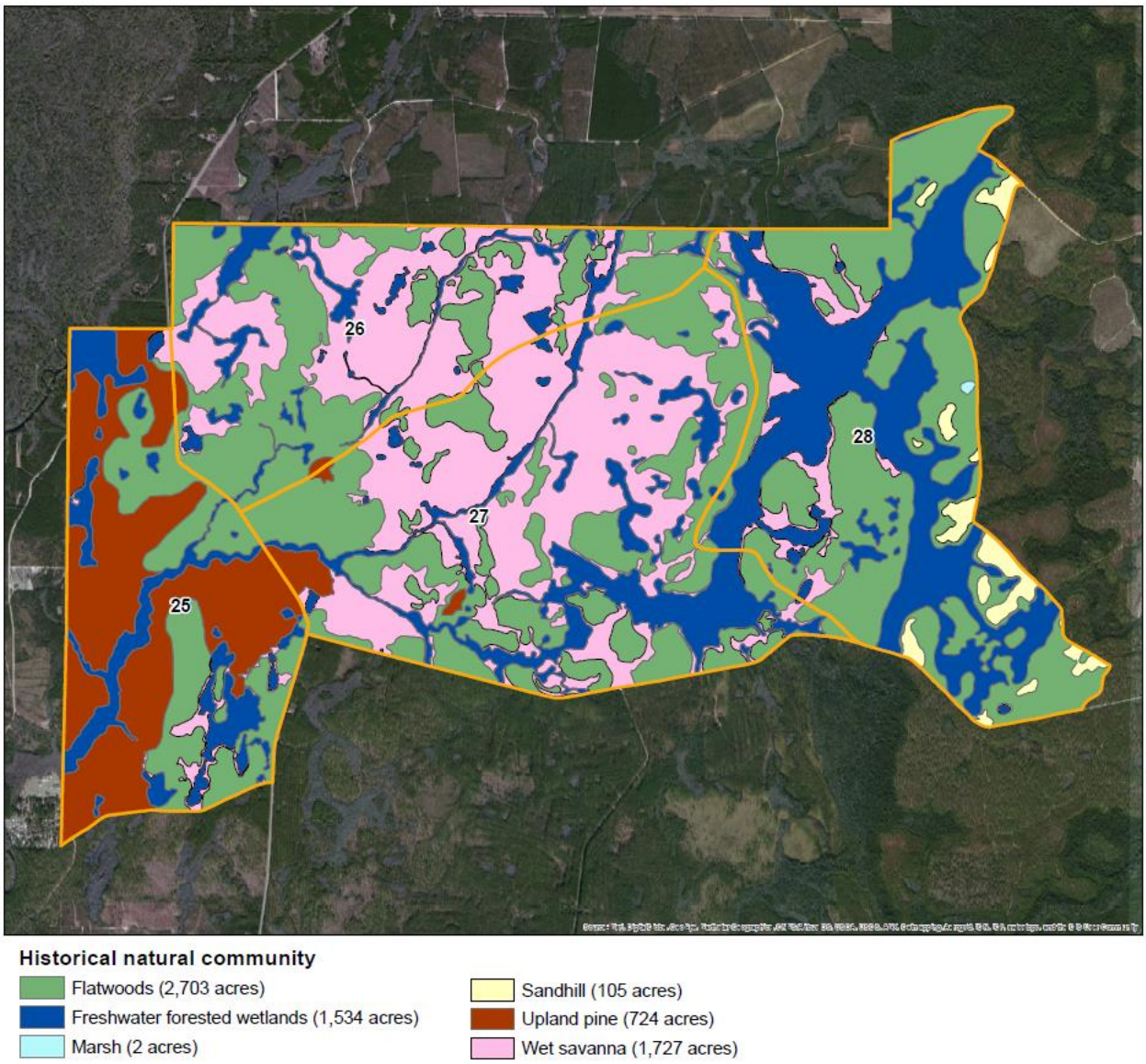
Figure 3. Remnant wet savanna stand with pine and woody encroachment

Despite the recognition that wet prairies had been lost and the emphasis on ecological restoration in other habitat types (e.g., flatwoods and sandhills), the Forest Plan did not include restoration

objectives for wet savannas because of uncertainty regarding their previous geographic extent and questions about appropriate restoration activities. Additional information about wet savannas, also known as wet prairies, may be found in a recently completed forestwide assessment of historical distribution and current conditions (available on the Beasley Pond Analysis Area website or upon request).

In 2010 the National Forests in Florida initiated a project with the Florida Natural Areas Inventory (FNAI) to identify and delineate historical natural communities of the Apalachicola National Forest. In 2011-2012, FNAI biologists generated a GIS-based historical natural community map based on multiple years of georeferenced aerial photography, soil surveys, LiDAR digital elevation models, vegetation plots, element occurrences of rare species and natural communities and ground-truthed GPS points (FNAI 2012). Historical vegetation was categorized according to FNAI's guide to Florida natural communities (FNAI 2010, available online at http://www.fnai.org/naturalcommguide.cfm).This investigation showed that many historical wet savannas have been converted to forests and that a distinct natural community (upland pine) has not been previously recognized in the project area (Figure 4).

Figure 4. Spatial distribution of historical communities with the Beasley Pond Analysis Area



The spatially-explicit delineation of natural communities completed by FNAI provides a basis for assessing the current ecological conditions of major habitat types. Desired conditions were defined from the Forest Plan or in FNAI's Guide to Natural Communities of Florida. The current vegetation structure conditions were estimated for ~0.52 acre cells from airborne LiDAR data, stands information from Forest Service databases, records of fire, site preparation and planting history and over 400 plots with detailed vegetation data from throughout the Apalachicola National Forest. By comparing the current conditions within habitats to the desired conditions, National Forests in Florida staff developed a five-tier ecological condition model for flatwoods, sandhills, wet prairies and upland pine habitats on the Apalachicola National Forest; forested wetlands were not considered in this evaluation. Although the model was based primarily on structural elements of the vegetation (e.g. height and density of canopy and midstory), it also

incorporated stand age and fire frequency. Ground-truth surveys showed that the model has high predictive ability of overall habitat quality, though it does not predict specific vegetation composition other than dominant canopy species from the Forest Service stands database.

The ecological condition model showed that much of the Beasley Pond Analysis Area is currently in poor to fair condition relative to the desired conditions for each habitat type (Figure 5, Table 1).

Figure 5. Ecological conditions in the Beasley Pond Analysis Area

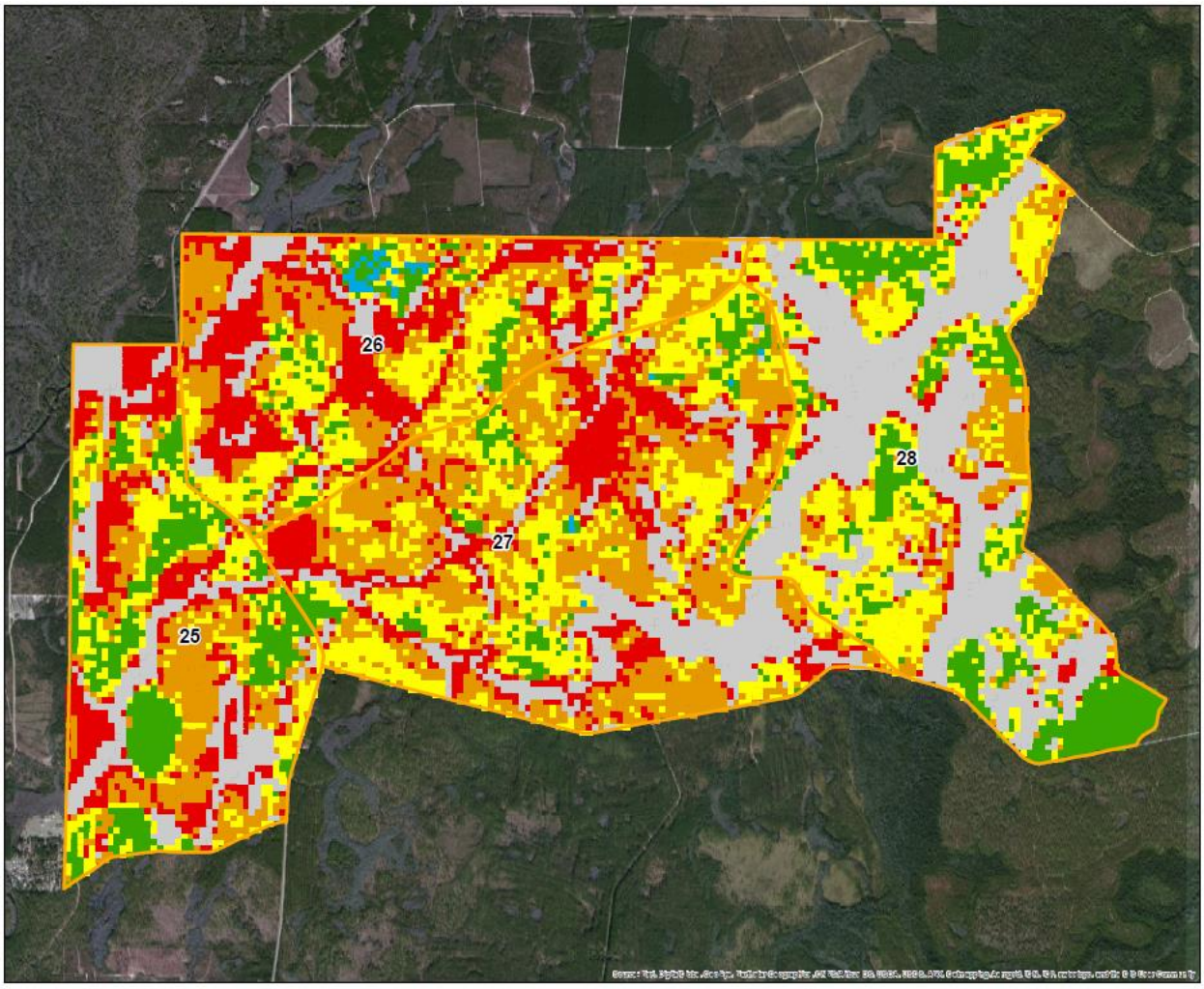
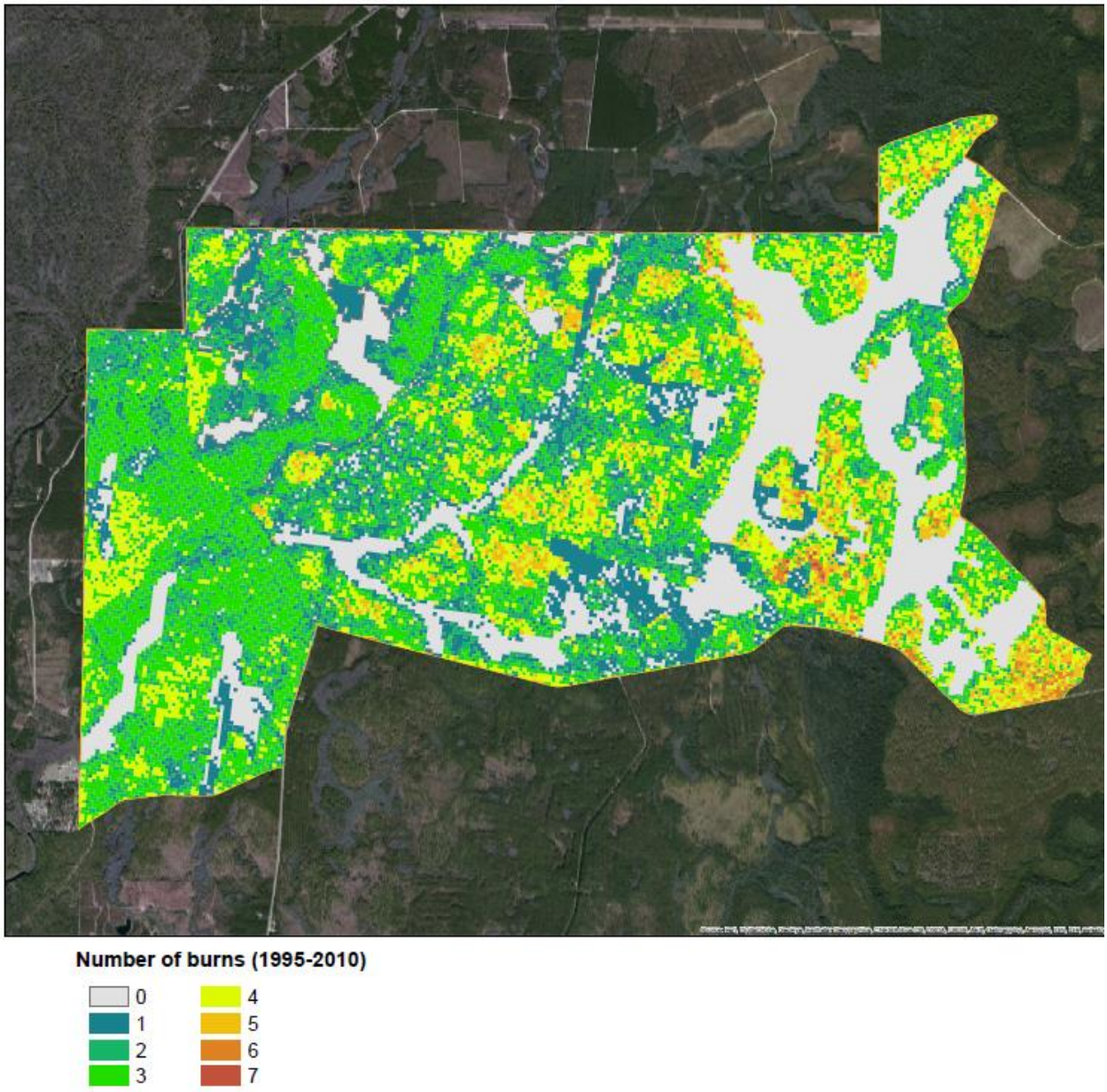


Table 1. Area of historical natural community in each level of ecological condition in Beasley Pond

	Area in each ecological condition (acres)				
Historical natural community	Excellent	Good	Fair	Poor	Very poor
Flatwoods	0	444.2	945.7	938.0	417.8
Sandhill	0	30.0	40.3	30.5	1.5
Upland pine	0	239.1	146.2	144.1	184.9
Wet savanna	19.6	102.3	482.9	530.4	567.1
Total	19.6	815.6	1,615.1	1,643	1,171.3

Fire is a critical process for maintaining both upland and wetland habitats on the Apalachicola National Forest. The Forest Plan established an objective of using prescribed fire at approximately 3 year intervals, with an emphasis on growing-season fire (USDA 1999b). Drought, weather conditions and the distribution of vegetation on the landscape can limit prescribed fire, but most of the Beasley Pond Analysis Area shows evidence of recent fire and many areas have met the objective of a 3 year fire interval. Because prescribed fire units are large (often including one or more compartments) and rarely burn uniformly, interpretation of satellite imagery was conducted following techniques described in Picotte and Robertson (2011) to determine smaller scale fire frequency within the project area (Figure 6).

Figure 6. Fire frequency with 0.52 acre cells in the project area



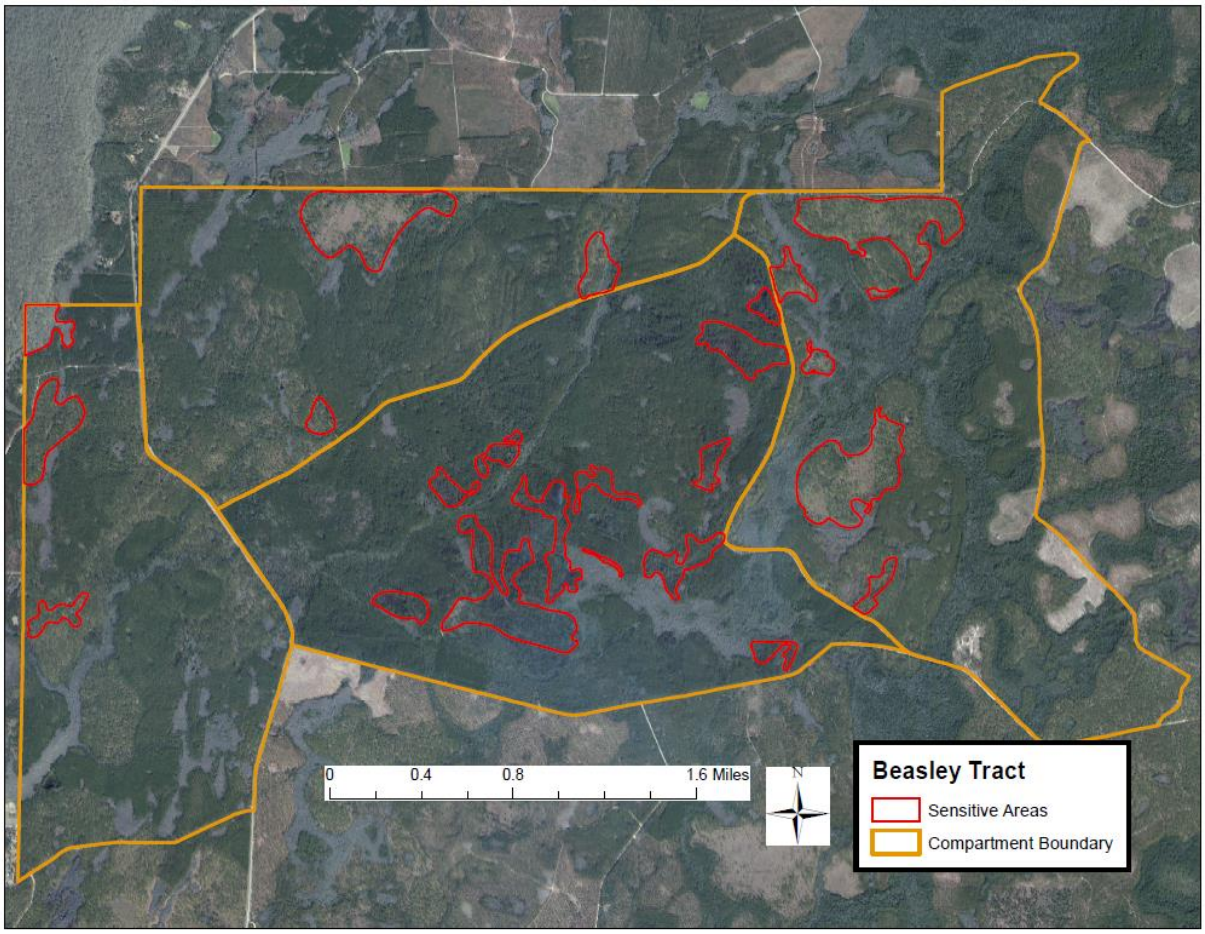
Satellite imagery from 1995-2010 showed a range of fire frequencies throughout the project area. When forested wetlands are excluded, the average number of fires that affected each ~0.5 acre cell during the 15 year period was 2.9 (compartment 25: 2.7, compartment 26: 2.7, compartment 27: 2.8, compartment 28: 3.4). Recent surveys (FNAI 2012) noted the presence of dense titi encroachment throughout the project area and high densities of mesic oaks (e.g., water oak) and sweetgum in several upland pine stands in compartment 25, both of which are at least partially due to fire exclusion or insufficient fire intensity. However, all four compartments have been burned since 2012; compartments 25 and 27 were last burned on February 18 2013, compartment 26 burned on March 15 2013, and compartment 28 on June 24 2012.

Sensitive Areas

The project area contains many high-quality habitats and ecologically sensitive areas (FNAI 2012). The Beasley Pond Analysis Area contains large areas of upland pine habitat. This natural community is characterized by a canopy of longleaf pine and a groundcover of wiregrass and other herbaceous vegetation but differs from other longleaf pine forests by having a sparse hardwood subcanopy of oaks (particularly red oak), flowering dogwood, hickory and magnolia (FNAI 2010). The wet savanna and flatwoods in the project area include some high-quality areas and continue to support rare plant and animal species, including two federally listed plant species (Godfrey's butterwort, *Pinguicula ionantha,* and Florida skullcap, *Scuttelaria floridana*), more than 30 active red-cockaded woodpecker clusters and critical habitat for the frosted flatwoods salamander. Additional information about these species may be found in Chapter 3 of this document and the project Biological Assessment.

FNAI delineated 24 sensitives areas throughout the Beasley Pond Analysis Area, most being wet savanna sites in 2013 (Figure 7). Other areas were identified as being wet flatwoods with longleaf pine canopy and wiregrass, floodplain swamps with large trees of tupelo, hickory, and bald cypress, and upland pine communities of longleaf pine and wiregrass with scattered oaks. These areas are described as "representing high quality, intact natural communities".

Figure 7. FNAI Identified Sensitive Areas in the Beasley Pond Analysis Area



The transportation system of the project area includes approximately 31.65 miles of designated system roads, 7.8 miles of system roads that are closed to the public, and 14.49 miles of non-system routes, which are also closed to the public. These roads are in moderate to poor condition and many will not provide safe public or administrative access without repair and maintenance.

Desired Condition

The introduction to the Forest Plan describes goals and objectives for the National Forests of Florida, several of which are particularly relevant to the Beasley Pond Analysis Area (USDA 1999b, p. 2.3-2.5):

> Goal 6. "Maintain or, where necessary, restore ecosystem composition, structure, and function within the natural range of variability in all ecosystems, with emphasis on longleaf pine-wiregrass, sand pine-oak scrub, pine flatwoods, hardwood/cypress, oak hammock ecosystems, and other imperiled specialized communities."
>
> Goal 7. "Manage floodplains, groundwater, lakes riparian areas, springs, streams, and wetlands to protect or enhance their individual values and ecological functions."

> Goal 8. "Conserve and protect important elements of diversity-such as endangered and threatened species habitat, declining natural communities, and uncommon biological, ecological, or geological sites."
>
> Goal 9. "Manage for habitat conditions to recover and sustain viable populations of all native species, with special emphasis on rare species."
>
> Objective 5. "Thin 45,000 to 55,000 acres of longleaf and slash pine stands to release overcrowded live crowns, favor appropriate pine species regeneration, increase stand growth, allow more sunlight onto the forest floor, and increase suitable habitat for red-cockaded woodpeckers (RCWs)."
>
> Objective 6. "Initiate uneven-aged management with group selection harvests on 30,000 to 33,000 acres principally in longleaf pine forests with some in slash pine forests."

The desired conditions for all lands within the National Forests in Florida and more specific desired conditions for Management Areas 7.1 and 7.2 are described in the Forest Plan (USDA 1999b). Understanding the project-level distribution of historical natural communities (shown in Figure 4) and recent surveys for rare species and habitats provide additional information that contributes to a vision for the future of the Beasley Pond Analysis Area.

Ecological restoration is based on the idea that some range of historical conditions can be identified as desirable goals for land management, and that our actions can put sites on a trajectory to approximate those conditions. Historical aerial photographs of the Beasley Pond Analysis Area from the early 1950s show an open vegetation structure with expansive treeless areas interspersed among forests of widely spaced pines with denser vegetation along drains (Figure 8). This photograph was taken after decades of logging, turpentine extraction, grazing and intentional burning. As such, it likely depicts conditions with fewer and smaller trees than were present before European settlement of the area. Current aerial photographs, by contrast, show dense upland forests, many slash pine plantations, few open areas and clear indications of reduced fire frequency (Figure 9). Although the historical photographs show a landscape that had been altered by timber harvest, they still provide a reasonable reference to inform future management as we work toward the Forest Plan goal of restoring ecosystem composition, structure and function within the natural range of variability (USDA 1999b).

Figure 8. Aerial photographs of the Beasley Pond Analysis Area from the 1950s

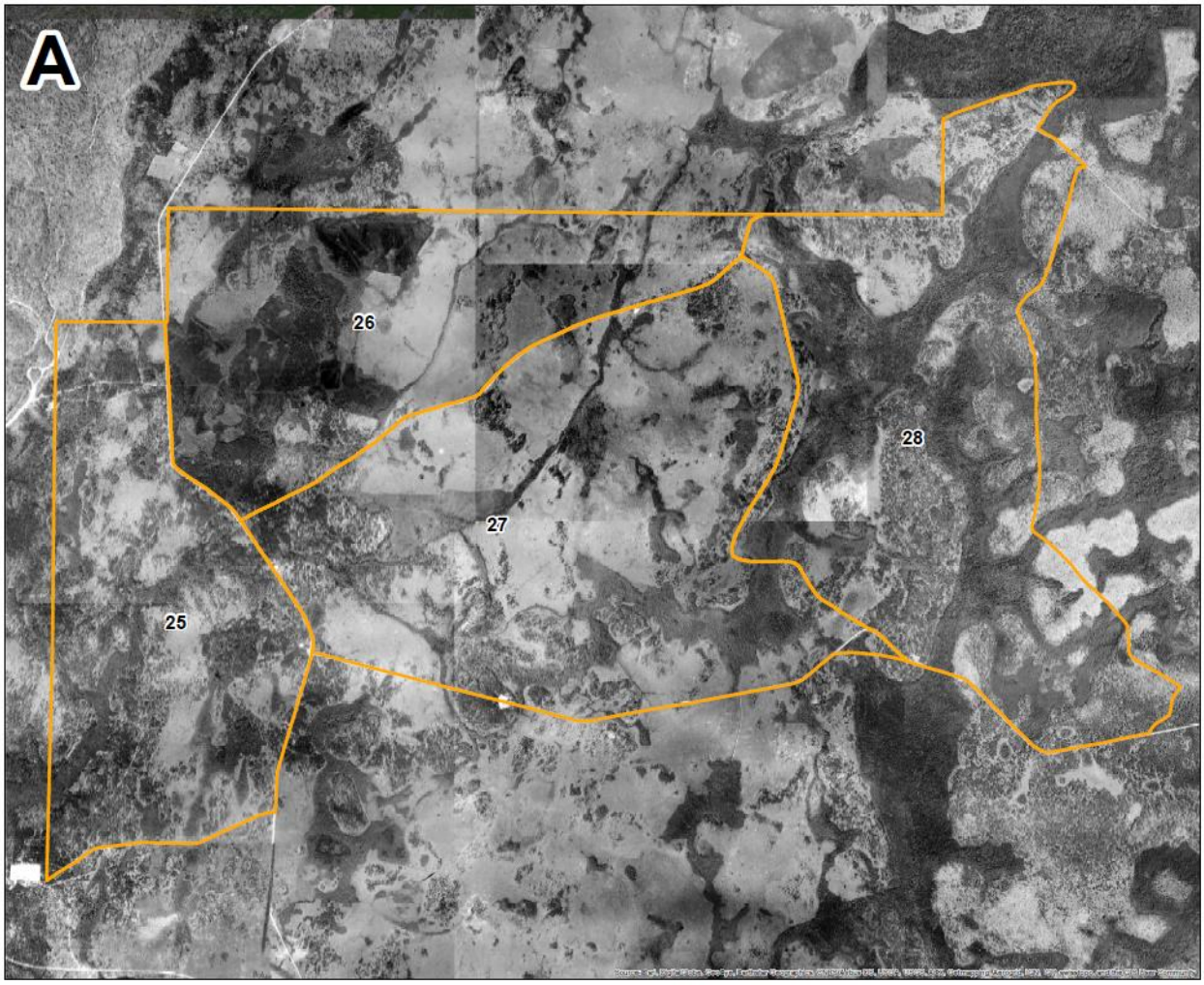
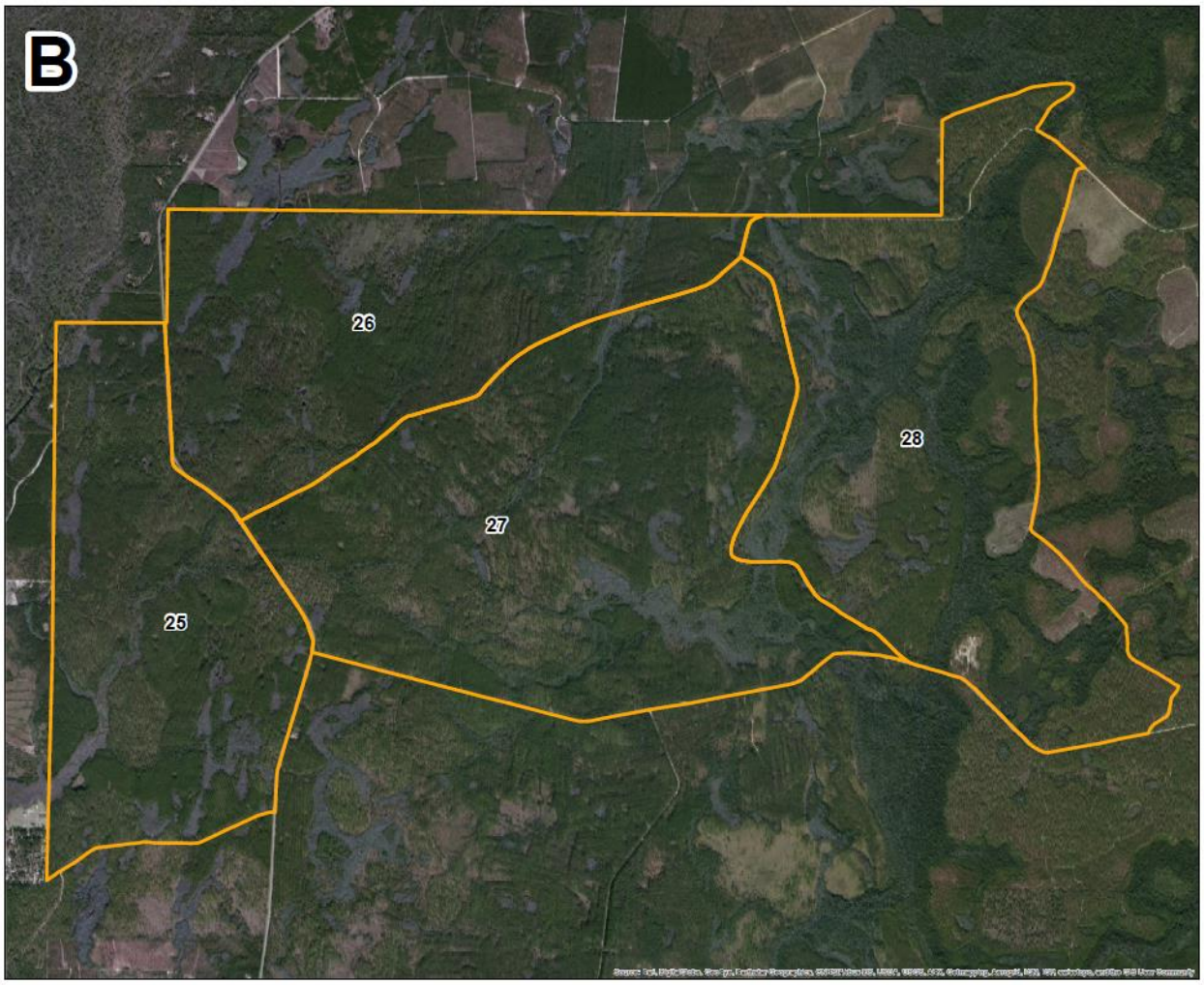


Figure 9. Aerial photograph of the Beasley Pond Analysis Area from 2014.



Over one-third of the project area is classified as historical flatwoods, and the desired conditions for MA 7.1 and 7.2 are most applicable to these stands. Vegetation structure in these areas will be managed to meet the criteria for Good Quality Foraging Habitat as described in the Recovery Plan for the red-cockaded woodpecker (*Picoides borealis*), Second revision (U.S. Fish and Wildlife Service 2003, p. 188-189) while also recognizing the need for multiple-use management including timber harvest. Management of older stands should favor longleaf pine, and will generally retain larger, older pines where they occur. Through frequent prescribed fire and periodic timber harvest using single tree and group selection, stands should be managed for an open, uneven-aged structure with patches of longleaf regeneration. They would have sparse or absent hardwood midstory and a dense groundcover of wiregrass and other native graminoids and forbs. In the short-term, many flatwoods stands will have a basal area of 40-80 ft^2/acre; as the stands mature, retention of large (>14in diameter) pines may result in a similarly low tree density but higher basal area. Management of slash or longleaf pine plantations will transition these stands to a more natural appearance, although this process will take decades of active management for younger plantations.

Desired conditions within upland pine and sandhill habitats are similar to those in flatwoods, with the primary difference being that these habitats should be dominated almost exclusively by longleaf pine rather than a mix of longleaf and slash pine and they often include a higher density of hardwoods. In upland pine habitats, hardwood midstory and canopy often includes low densities of southern red oak, flowering dogwood, hickories and magnolia (FNAI 2010). In sandhill habitats, turkey oak and other xeric oak species are often present as a sparse midstory. Even with a higher density of hardwood trees, stands in these habitats will be managed according to the guidelines in the RCW Recovery Plan and desired conditions for vegetation structure include sustained timber harvest while managing for Good Quality Foraging Habitat.

The desired conditions for areas identified as historical wet savannas are not clearly defined in the Forest Plan and determining appropriate goals for these areas is complicated by the extensive alteration of many wet savannas by past management. The FEIS for the Forest Plan estimated that the Apalachicola National Forest included 6,043 acres of bog, seepage slope, depression marsh and wet prairie/savanna habitat association (USDA 1999b, p. 3.68). Despite the recognition that wet savannas had been lost and the emphasis on ecological restoration in other habitat types (e.g., flatwoods and sandhills), the Forest Plan does not include habitat-specific restoration objectives for wet savannas. However, the Forest Plan recognizes the need to identify and restore significant botanical sites (USDA 1999a, Forestwide Goal 8, p. 2.4, Forestwide Guideline VG-4, p. 3.18).

The historical natural communities map showed that wet savannas formerly encompassed over 36,000 acres on the Apalachicola National Forest, primarily in a large area running north-south along the western side of the Apalachicola District. The Beasley Pond Analysis Area is located in the northern part of this zone and historical aerial photographs show extensive open wet savannas in compartments 26 and 27. Small, remnant wet savannas within the project area and larger, high-quality savannas to the south (primarily in Management Areas 2.1 and 3.1) provide appropriate reference conditions for this habitat type. Vegetation plots in wet savannas surveyed for an ecological inventory of the Apalachicola National Forest had an average crown closure of 5% (Collins et al. 2001, p. 4.28). In high-quality wet prairies, shrubs (e.g., titi, gallberry, St. John's wort, wax myrtle) are often present but their growth is limited by frequent fire. As trees are harvested from wet savanna sites, groundcover will respond and will create a positive feedback with prescribed fire.

Given the variation in past management and current condition of wet savanna sites, it is reasonable to modify desired conditions in the short term based on what can realistically be achieved with typical forest management actions:

- Sites in good or excellent condition are already in the desired condition and require no active management other than continued prescribed fire and periodic timber thinning from around the edges. In some cases where fire has been excluded from wetland ecotones, maintaining wet savannas may require mechanical reduction of shrubs such as titi that may have disrupted prescribed fire.

- Sites in fair condition usually have some intact groundcover but shrub and tree density is higher than desired for wet savannas due to encroachment during periods of low fire

frequency or intensity. In these areas, thinning trees through harvest combined with a greater emphasis on short fire return intervals and early growing season fire (March to June) will likely restore structure, function and composition of wet savanna sites (Kindell 1997, p. 44).

- Sites in poor condition often have some recognizable elements of wet savanna vegetation. Many narrow, ecotonal wet savannas that have been encroached upon by titi have some remnant groundcover with few canopy trees. In other areas, historical wet savannas were planted as slash pine plantations in the 1950s or 1960s but have remnant groundcover with few shrubs. In both cases, removal of woody vegetation and prescribed fire would be required to encourage the grassy and herbaceous understory typical of wet savannas. Notably, in some cases rapid removal of dense slash pine canopies in mesic or hydric sites may lead to a strong positive response by undesirable shrubs.

- The sites in very poor condition often have no or very few recognizable elements of wet savanna. The grassy and herbaceous groundcover is apparently lost (though may persist as isolated plants or in the seed bank). In many cases these sites have been bedded and planted with slash pines; occasionally wiregrass, pitcherplants or sundews may be found at the end of beds along roads. For sites planted with slash pine, thinning the canopy and continued efforts to burn the stand are reasonable and low-risk steps toward restoration. Re-establishment of wet savanna groundcover is poorly understood and active attempts such as seeding or planning seedlings may not be warranted given this uncertainty. Hydrological conditions are among the defining abiotic factors contributing to wet savannas, but removing beds from pine plantations would disturb the soil and may also have unintended hydrological consequences. Historical wet savanna sites that have been so dramatically altered may merit considering alternative desired conditions, perhaps with the goal of managing the stands more like wet flatwoods than like high-quality wet savannas. In either case, thinning the pine canopy is a desirable first step to determine the restoration potential of the site because it will allow more light for the groundcover while still providing needlecast for prescribed fire.

Figure 10. Desired wet savanna condition of grassy generally treeless openings

It is likely that restoring all historical wet savannas at the site is not economically feasible or would require short-term actions with undesirable effects. Therefore, we propose an adaptive approach that includes modifying future activities and site-specific objectives based on how the initial actions (particularly thinning dense pine canopies) affect the structure and composition of sensitive wet savanna habitats.

Except for occasional timber harvest, the primary management tool within the Beasley Pond Analysis Area will be prescribed fire. In accordance with the Forest Plan, fire-dependent ecosystems in the project area will be burned frequently (preferentially in the growing season) to mimic the extent, duration, and intensity of natural fire regimes. When possible, fire will be allowed into wetlands to reduce titi encroachment into stands and reduce woody vegetation around isolated ephemeral wetlands. Fire will be facilitated by management for more open forest structure as wiregrass and other native, fire-adapted groundcover species respond positively to increased light availability.

As management promotes desired conditions of vegetation structure and composition, habitat quality will improve for plant and animal species that prefer mature longleaf and slash pine forests and savannas. More open conditions and facilitation of prescribed fire will improve habitat for the two federally threatened plant species known to occur in the project area (Godfrey's butterwort and Florida skullcap), and will create habitat conditions suitable for the other two federally listed species known from the Apalachicola District (Harpers beauty, *Harperocallis flava*, and white birds-in-a-nest, *Macbridea alba*). Restored wet savannas will be characterized by a dense groundcover of wiregrass and diverse herbaceous vegetation, including

carnivorous plants and other habitat specialist species. Many characteristic bird species of southern pine forests should benefit from the desired vegetation conditions, including Bachman's sparrows, bobwhite quail, red-cockaded woodpeckers, brown-headed nuthatches and southeastern kestrels. Based on the estimated habitat requirements used in the Forest Plan FEIS and the RCW Recovery Plan, the project area should support at least 26 RCW clusters to meet the proportional contribution to the population goal. Habitat in sandhills, upland pine and mesic flatwoods will be improved and will be suitable for gopher tortoises and their burrow commensals, including the federally threatened eastern indigo snake. Frosted flatwoods salamander habitat, both in breeding ponds and in surrounding uplands, will be improved through savanna restoration, thinning pine stands and facilitating fire through isolated wetlands. Game species will continue to exist and many will benefit from the more open conditions.

Most of the roads in the area will continue to have native surfacing and will be rough and irregular even after the proposed management actions. In low areas, navigable roads will usually have ditches and are above the surrounding grade. Many drainage points that cross roads will continue to have low-water rock crossings making passage easier. However, travel with low-clearance vehicles will be generally difficult, with the irregularity of the road surface and occasional changes in overall road quality. In some circumstances, roads will also have an artificially improved sand-clay surfacing, will be higher than the surrounding grade, and have ditches. In low areas, these may have culverts or bridges (USDA 1999a). These roads may not be stable during bad weather conditions, but will be generally more navigable than the native surfaced roads discussed previously. However, rutting, roughness, and dust will be present most of the time and a high clearance vehicle will still be recommended. There will be a few higher-quality roads with limerock surfacing or pavement. These are stable and smooth all the time, have little dust or roughness and will be accessible by most vehicles.

Proposed Action

The Forest Service proposes the following to meet the project purpose and need:

- Thinning of approximately 2068 acres of slash and longleaf plantations or mature stands.
- Implement uneven-aged management cuts (UEAM) on 833 acres of longleaf pine stands.
- Conduct wet savanna restoration treatments on 811 acres.
- Clearcut 16 acres of slash pine for borrow pit excavation.
- Apply the herbicide triclopyr (as needed) for woody species control on an estimated 811 acres savannas.
- Remove cattle guards, fence, and stays from a closed cattle allotment.
- Reconstruct approximately 12.83 miles of system roads.
- Temporary improvement and use of approximately 4 miles on non-system roads.

Connected actions would include log landings, landline maintenance, and road maintenance. These actions, if approved, would take place within the next 3 to 5 years.

Decision Framework

Given the project purpose and need, the Responsible Official reviews the proposed action and other alternatives as well as the environmental consequences in order to make the following decisions:

- Which alternative best meets the purpose and need for the proposal?
- How each alternative addresses the issues developed by the interdisciplinary team and through public involvement?
- Which alternative or combination of alternatives to implement?

Public Involvement

This proposal was initially listed in the Schedule of Proposed Actions for National Forests in Florida beginning the 3rd Quarter of Fiscal Year 2013. Initial scoping was completed in June 2013 by sending a letter and treatment map to the forest scoping list requesting comments on the draft proposed action. On October 10, 2014 the proposal was reinitiated with a Notice of Intent (NOI) to prepare an EIS. The NOI was published for comment 30 days following its availability on the Federal Register.

During this phase of public involvement a notice of availability of the Draft EIS is being published to the Federal Register and will initiate the 45 day notice and comment period. In addition, a legal notice will be published in the *Calhoun Liberty Journal* followed by correspondence letters sent to concerned citizens, adjacent landowners, organizations, and other agencies informing them of the availability of the draft EIS for review and comments. A 45 day objection period will follow and apply only to those who submitted timely, specific written comments. Issues raised in objections must be based on previously submitted specific written comments regarding the proposed project and attributed to the objector, unless the issue is based on new information that arose after a designated opportunity to comment.

Based on the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address in the EIS.

Issues

The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" The Forest Service separated the issues raised in public comments into two groups: those that are unresolved and require additional analysis to determine if they are related to significant environmental effects and those that do not require additional analysis. Issues that are in the following categories generally do not require additional analysis: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence.

The Forest Service identified the following issues during scoping that are addressed in the EIS:

1. The use of herbicides is a highly controversial management activity with potential environmental and human health impacts.

2. Timber logging and hauling activities could negatively impact rare and sensitive plant and animal species.
3. Removal of trees for wet savanna restoration reduces foraging habitat available for the RCW.

Other Related Efforts

This EIS is tiered to the Final Environmental Impact Statement (FEIS) and Record of Decision for the Land and Resource Management Plan for the National Forests in Florida (1999a). The activities proposed in the Beasley Pond Analysis Area project were designed to implement the Forest Plan. Issues addressed in the Forest Plan FEIS that are not directly relevant to this project are not discussed in detail. The Forest Plan FEIS is available for review by request from the District Office or online at the following web addresses:
Forest Plan http://www.fs.usda.gov/detail/florida/landmanagement/?cid=STELPRDB5269793

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Wakulla Ranger District Office in Crawfordville, Florida.

Chapter 2. Alternatives, Including the Proposed Action

This chapter describes and compares the alternatives considered for the Beasley Pond Analysis Area. It includes a description and map of each alternative considered and presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon design (i.e. herbicide use for savanna restoration versus mowing or other mechanical methods) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e. the amount of ground disturbance caused by herbicide application versus mowing or other mechanical methods).

Alternatives Considered in Detail

The Forest Service developed four alternatives, including the No Action and Proposed Action alternatives, in response to issues raised by the public.

Alternative A. No Action

Under the No Action alternative, current management activities such as prescribed burning and non-native invasive species treatments would continue to occur throughout the project area. No new activities would be implemented to accomplish project goals.

Alternative B. Proposed Action

The Forest Service is proposing harvesting and ecological restoration treatments on approximately 3,700 acres within the Beasley Pond Analysis Area. The primary purpose of this proposal is to maintain, improve, and restore a healthy forest ecosystem and to continue progress towards restoration of historic wet savannas. These actions are needed to implement the direction set forth in the Land and Resource Management Plan in order to achieve the desired future conditions for Management Areas 7.1 and 7.2. Detailed descriptions of the proposed treatments are as follows:

- First or intermediate thinning of approximately 2068 acres of slash and longleaf pine stands. Stands range in age from 25 to 141 years old. Younger slash and longleaf pine plantations have a basal area (BA) ranging from 70 to 173 square-feet per acre. Thinning these stands would reduce the BA to an average of 50 square feet per acre thus opening the stands for sunlight penetration needed for continued growth and groundcover establishment.

- Conduct uneven-aged management cuts on 833 acres of mature longleaf pine. In areas of existing longleaf pine regeneration trees would be removed to create openings that would encourage seedling development and growth. Openings will range from ¼ -2 acres (average size of ½ acre) in size. The stand in its entirety will be thinned to 50 square feet per acre of basal area.

- Wet savanna restoration treatments on approximately 811 acres of savanna sites. Girdling will be used in stands that cannot be accessed for traditional logging operations (stands 19 and 41 in compartment 26 and stand 37 in compartment 27). All of these sites have either been planted over with slash pine or have been encroached upon by woody brush species and hardwood tree species. To restore these wet savanna sites a variable residual BA strategy will be implemented with groundcover condition serving as the trigger point for thinning intensity. In portions of the stand where herbaceous groundcover is deemed sufficient the Forest Service proposes to thin to a residual BA of 10-30 square feet per acre of standing live timber. Sufficient groundcover is needed when thinning to a lower BA in order to continue the use of prescribed fire as a means of maintaining the open park-like structure associated with wet savannas. When groundcover conditions are deemed less than adequate to carry fire the Forest Service proposes to leave a residual BA of 40 in order to allow needle cast to serve as primary carrier of fire across the stand.

- Foliar application of the herbicide triclopyr (as needed) on 811 acres of wet savanna restoration sites for woody species control. Treatment would consist of using backpack sprayers only where there is a presence of woody vegetation that threatens the re-establishment of wet savanna plant species. If the savanna restoration areas do not show evidence of woody re-sprouting after harvest it will not receive chemical treatment.

- Clearcut 16 acres of slash pine plantation for borrow pit excavation to provide surface material for future road work.

- Remove six cattle guards from a closed cattle allotment (two on highway 379, two on FSR 113, and one on FSRs 174 and 109).

Connected actions necessary to facilitate the proposed action include maintenance of 7.5 miles of landlines, reconstruction of approximately 12.83 miles of system roads, temporary improvement and use of approximately 4 miles of non-system which provide access to pine plantations, and the maintenance of approximately 14.73 miles of system roads used to haul timber products from the analysis area.

Figure 11. Alternative B Compartment 25 Proposed Treatment Map

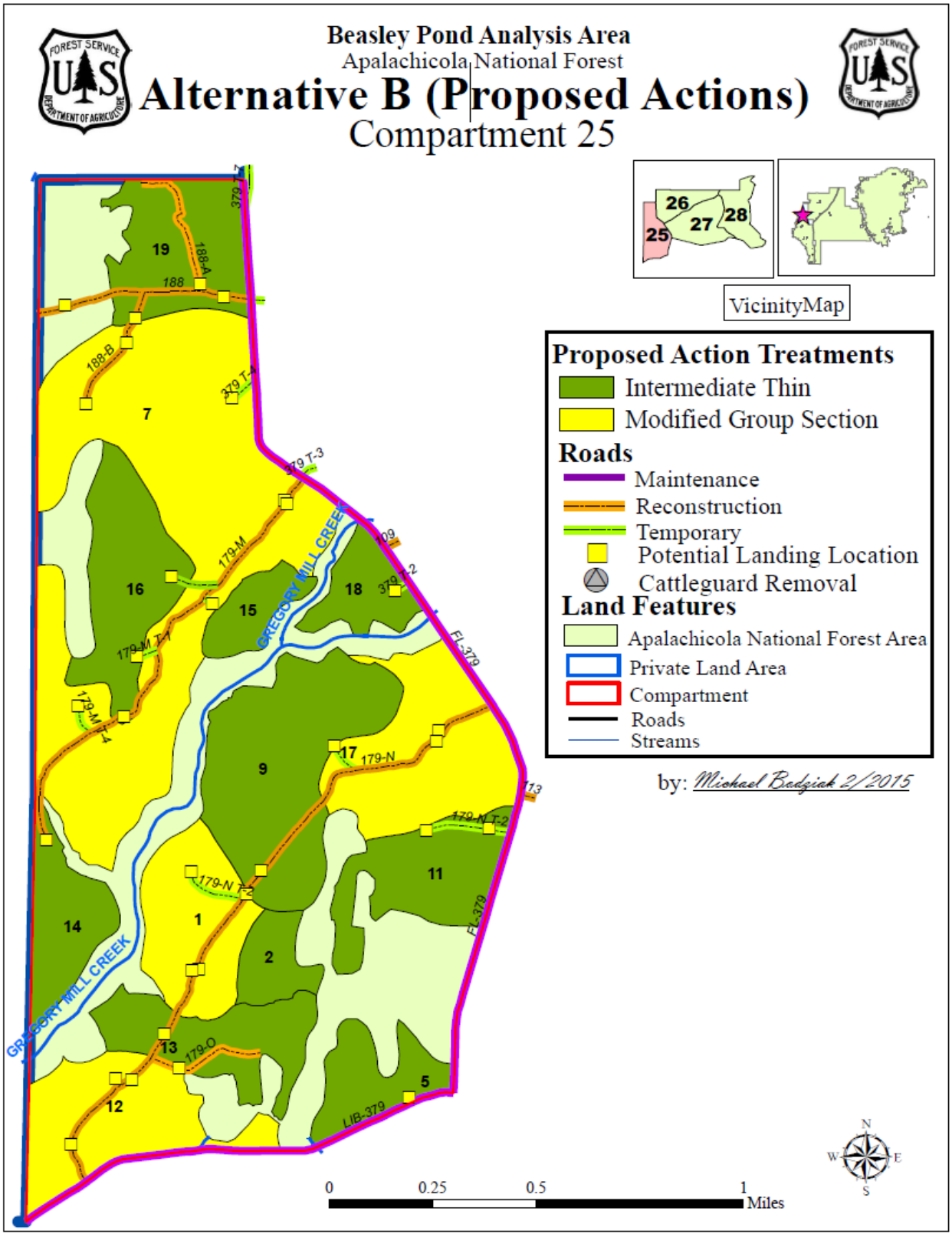


Figure 12. Alternative B Compartment 26 Proposed Treatment Map

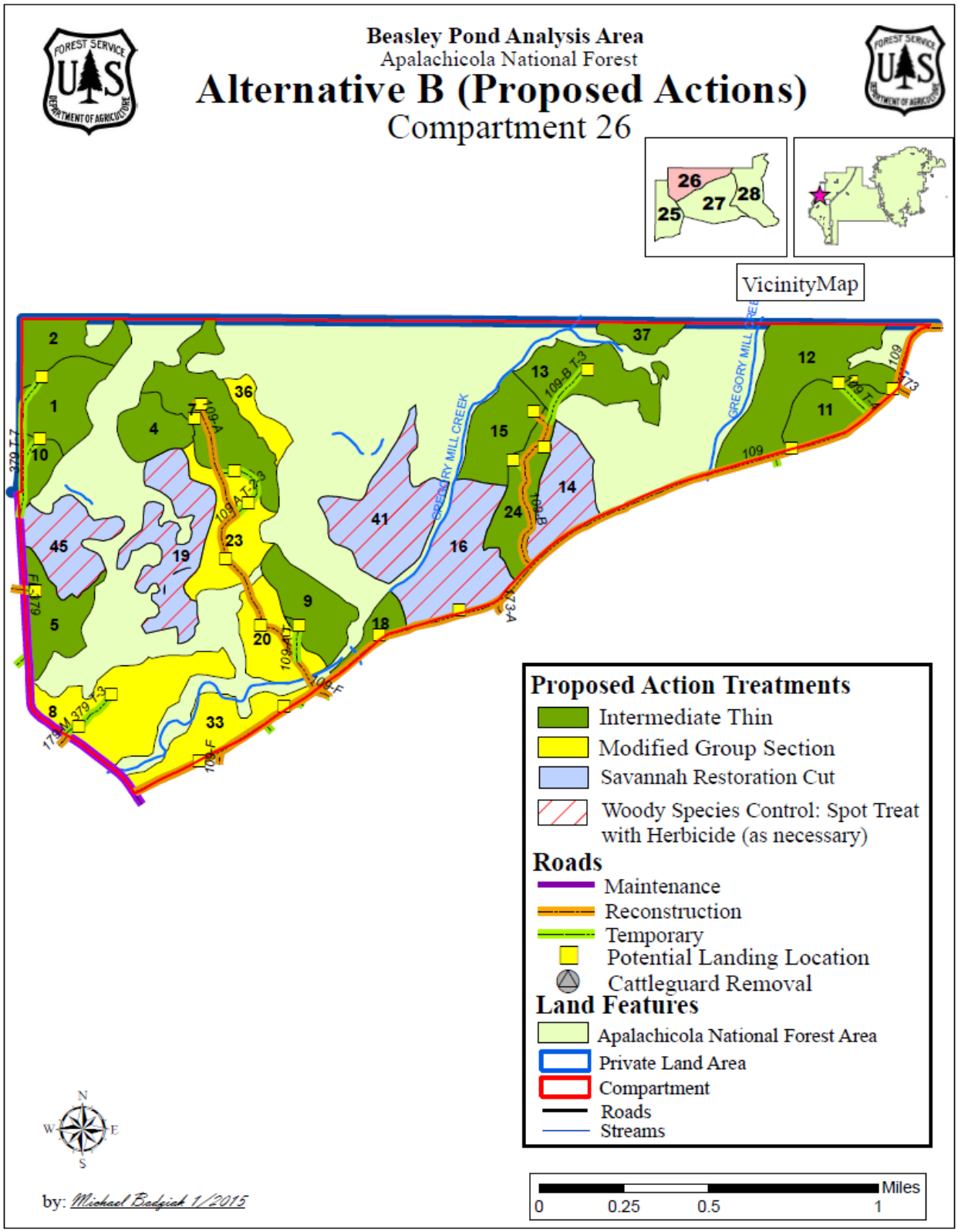


Figure 13. Alternative B. Compartment 27 Proposed Treatment Map

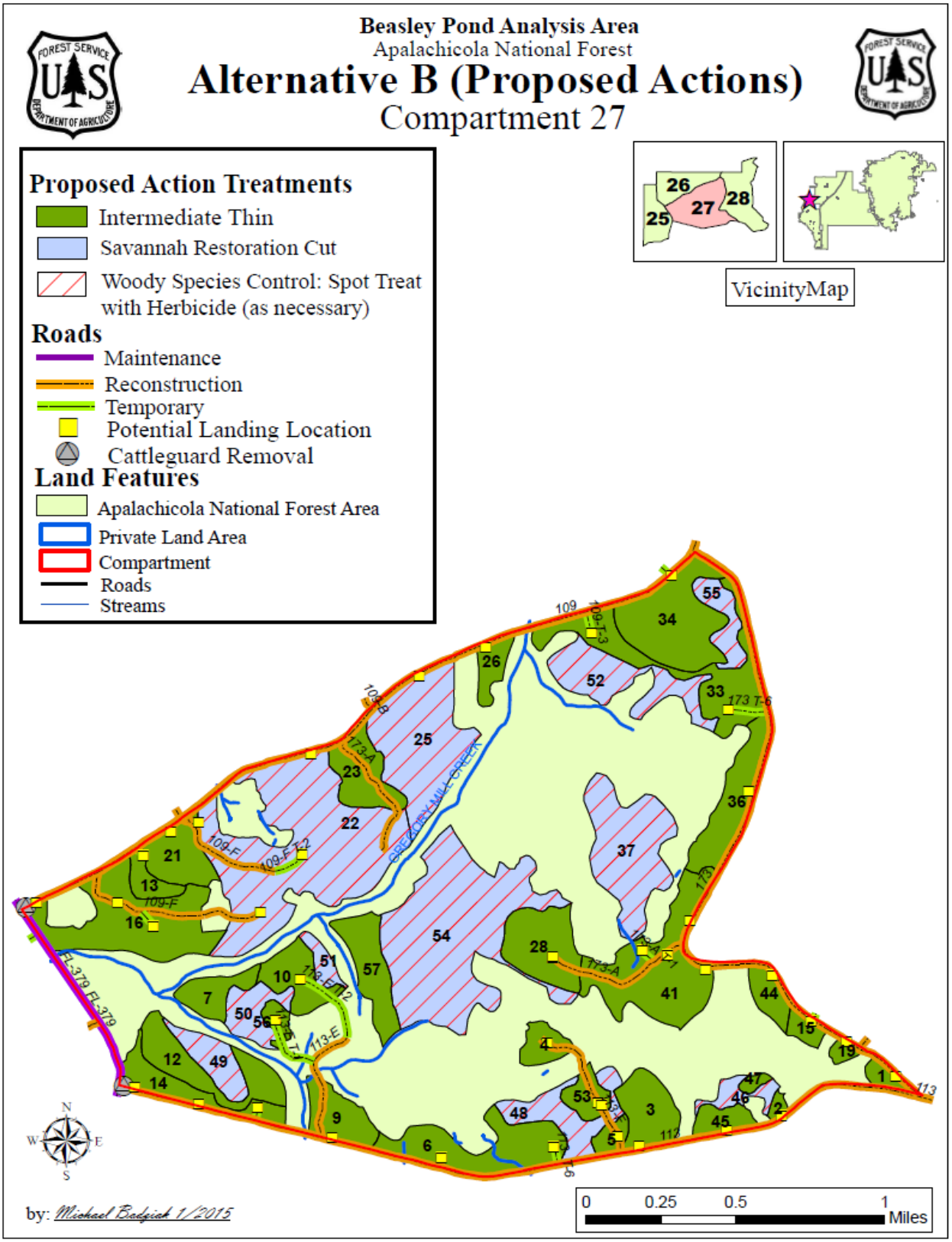


Figure 14. Alternative B. Compartments 28 & 29 Proposed Treatment Map

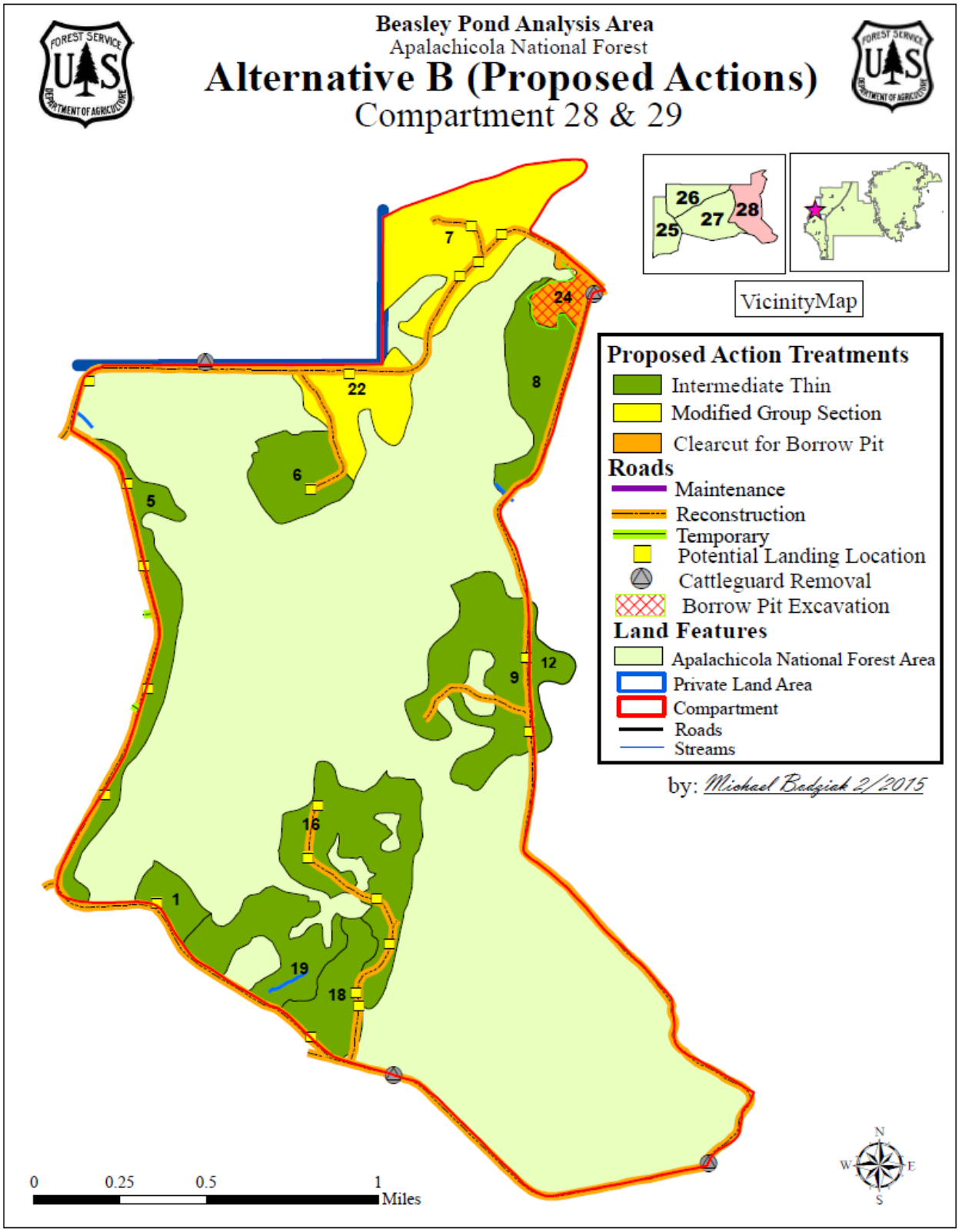


Table 2. Proposed Action Treatment Table

CPMT	Stand	Acres	Forest Type	Age	Treatment	Triclopyr
25	1	62	Longleaf Pine	86	Modified Group Selection	
25	2	21	Slash Pine	54	Thin	
25	5	35	Slash Pine	42	Thin	
25	7	285	Longleaf Pine	81	Modified Group Selection	
25	9	114	Slash Pine	42	Thin	
25	11	58	Slash Pine	42	Thin	
25	12	76	Longleaf Pine	86	Modified Group Selection	
25	13	54	Slash Pine	31	Thin	
25	14	39	Slash Pine	31	Thin	
25	15	21	Slash Pine	31	Thin	
25	16	65	Slash Pine	31	Thin	
25	17	91	Longleaf Pine	83	Modified Group Selection	
25	18	27	Longleaf Pine	83	Thin	
25	19	66	Slash Pine	31	Thin	
26	1	30	Slash Pine	72	Thin	
26	2	24	Slash Pine	43	Thin	
26	4	19	Slash Pine	43	Thin	
26	5	29	Slash Pine	72	Thin	
26	7	50	Slash Pine	31	Thin	
26	8	61	Longleaf Pine	86	Modified Group Selection	
26	9	30	Slash Pine	42	Thin	
26	10	11	Slash Pine	43	Thin	
26	11	25	Slash Pine	65	Thin	
26	12	63	Longleaf Pine	43	Thin	
26	13	39	Slash Pine	30	Thin	
26	14	31	Slash Pine	54	Wet savanna Restoration Thin to 10-40 BA	31
26	15	31	Slash Pine	72	Thin	
26	16	54	Slash Pine	72	Wet savanna Restoration Thin to 40	54
26	18	10	Slash Pine	42	Thin	
26	19	50	Undrained Flatwoods	76	Wet savanna Restoration Thin to 40 (Girdle)	50
26	20	30	Longleaf Pine	86	Modified Group Selection	
26	23	48	Longleaf Pine	86	Modified Group Selection	
26	24	29	Longleaf Pine	118	Thin	

CPMT	Stand	Acres	Forest Type	Age	Treatment	Triclopyr
26	33	32	Longleaf Pine	86	Modified Group Selection	
26	36	11	Longleaf Pine	86	Modified Group Selection	
26	37	10	Slash Pine	31	Thin	
26	41	55	Undrained flatwoods	76	Wet savanna Restoration Thin to 40 (Girdle)	55
26	45	34	Slash Pine	72	Wet savanna Restoration Thin to 40	34
27	1	7	Longleaf Pine	25	Thin	
27	2	3	Longleaf Pine	25	Thin	
27	3	27	Slash Pine	43	Thin	
27	4	12	Longleaf Pine	26	Thin	
27	5	7	Slash Pine	72	Thin	
27	6	49	Slash Pine	56	Thin	
27	7	16	Longleaf PIne	85	Thin	
27	9	22	Longleaf Pine	26	Thin	
27	10	23	Slash Pine	43	Thin	
27	12	34	Slash Pine	72	Thin	
27	13	10	Longleaf Pine	87	Thin	
27	14	58	Longleaf Pine	87	Thin	
27	15	8	Longleaf Pine	25	Thin	
27	16	73	Longleaf Pine	43	Thin	
27	19	4	Longleaf Pine	25	Thin	
27	21	25	Slash Pine	56	Thin	
27	22	164	Slash Pine	72	Wet savanna Restoration Thin to 40	164
27	23	29	Longleaf Pine	123	Thin	
27	25	77	Slash Pine	54	Wet savanna Restoration Thin to 40	77
27	26	12	Slash Pine	67	Thin	
27	28	37	Slash Pine	54	Thin	
27	33	57	Slash Pine	65	Thin	
27	34	58	Longleaf Pine	141	Thin	
27	36	37	Slash Pine	26	Thin	
27	37	63	Longleaf Pine	56	Wet savanna Restoration Thin to 40 (Girdle)	63
27	41	71	Slash Pine	56	Thin	
27	44	13	Slash Pine	51	Thin	
27	45	11	Slash Pine	72	Thin	
27	46	9	Slash Pine	72	Wet savanna Restoration Thin to 10-40 BA	9

CPMT	Stand	Acres	Forest Type	Age	Treatment	Triclopyr
27	47	3	Slash Pine	72	Thin	
27	48	30	Slash Pine	72	Wet savanna Restoration Thin to 10-40 BA	30
27	49	19	Slash Pine	72	Wet savanna Restoration Thin to 40 BA	19
27	50	19	Longleaf Pine	85	Wet savanna Restoration Thin to 10-40 BA	19
27	51	8	Slash Pine	43	Wet savanna Restoration Thin to 10-40 BA	8
27	52	41	Slash Pine	67	Wet savanna Restoration Thin to 10-40 BA	41
27	53	12	Slash Pine	77	Thin	
27	54	141	Slash Pine	56	Wet savanna Restoration Thin to 10-40 BA	141
27	55	16	Slash Pine	65	Wet savanna Restoration Thin to 10-40 BA	16
27	56	6	Longleaf Pine	85	Thin	
27	57	28	Longleaf Pine	56	Thin	
28	1	15	Slash Pine	51	Thin	
28	5	52	Longleaf Pine	81	Thin	
28	6	38	Slash Pine	54	Thin	
28	7	91	Longleaf Pine	81	Modified Group Selection	
28	8	46	Slash Pine	44	Thin	
28	9	79	Slash Pine	32	Thin	
28	16	87	Slash Pine	32	Thin	
28	18	33	Slash Pine	51	Thin	
28	19	51	Slash Pine	93	Thin	
28	22	46	Longleaf Pine	80	Modified Group Selection	
28	24	16	Slash Pine	44	Clearcut Site For Borrow Pit Excavation	
29	12	15	Slash Pine	32	Thin	
Totals		**3728**				811

Alternative C. Reduced direct impacts on threatened and endangered species

Alternative C implements all treatments identified in Alternative B with the exception of stands 37, 54, and 57 in compartment 27 and stand 19 in compartment 28 being removed to reduce potential impact to the rare plant species Florida skullcap. All proposed wet savanna restoration treatments will be thinned to 40 BA to reduce potential impacts to RCW habitat and timber harvest would follow seasonal guidelines in the RCW Recovery Plan to avoid disturbance during the April-July breeding season. Detailed descriptions of the treatments are as follows:

- First or intermediate thinning of approximately 1989 acres of slash and longleaf pine stands. Stands range in age from 25 to 141 years old. Younger slash and longleaf pine plantations have a basal area (BA) ranging from 70 to 173 square-feet per acre. Thinning these stands would reduce the BA to an average of 50 square feet per acre thus opening the stands for sunlight penetration needed for continued growth and groundcover establishment.

- Conduct uneven-aged management cuts on 833 acres of mature longleaf pine. Openings ranging from ¼ -2 acres (average size of ½ acre) in size will be created throughout the stand to encourage natural regeneration of longleaf pine seedlings.

- Wet savanna restoration treatments on approximately 670 acres of wet savanna sites. Girdling will be used in stands that cannot be accessed for traditional logging operations (stands 19 and 41 in compartment 26 and stand 37 in compartment 27). All of these sites have either been planted over with slash pine or have been encroached upon by woody brush species and hardwood tree species. To restore these wet savanna sites the Forest Service proposes to thin to 40 BA to open the forest floor and promote wet savanna plant species.

- Application of the herbicide triclopyr (as needed) on 670 acres of wet savanna restoration sites for site woody species control. Treatment would occur only where there is a presence of woody vegetation that threatens the re-establishment of wet savanna plant species. If the wet savanna restoration areas do not show evidence of woody re-sprouting after harvest it will not receive chemical treatment.

- Clearcut 16 acres of slash pine plantation for borrow pit excavation to provide surface material for future road work.

- Remove six cattle guards from a closed cattle allotment (two on highway 379, two on FSR 113, and one on FSRs 174 and 109).

Connected actions necessary to facilitate the proposed action include maintenance of 7.5 miles of landlines, reconstruction of approximately 12.83 miles of system roads, temporary improvement and use of approximately 4 miles of non-system which provide access to pine plantations, and the maintenance of approximately 14.73 miles of system roads used to haul timber products from the analysis area.

Figure 15. Alternative C Compartment 25 Proposed Treatment Map

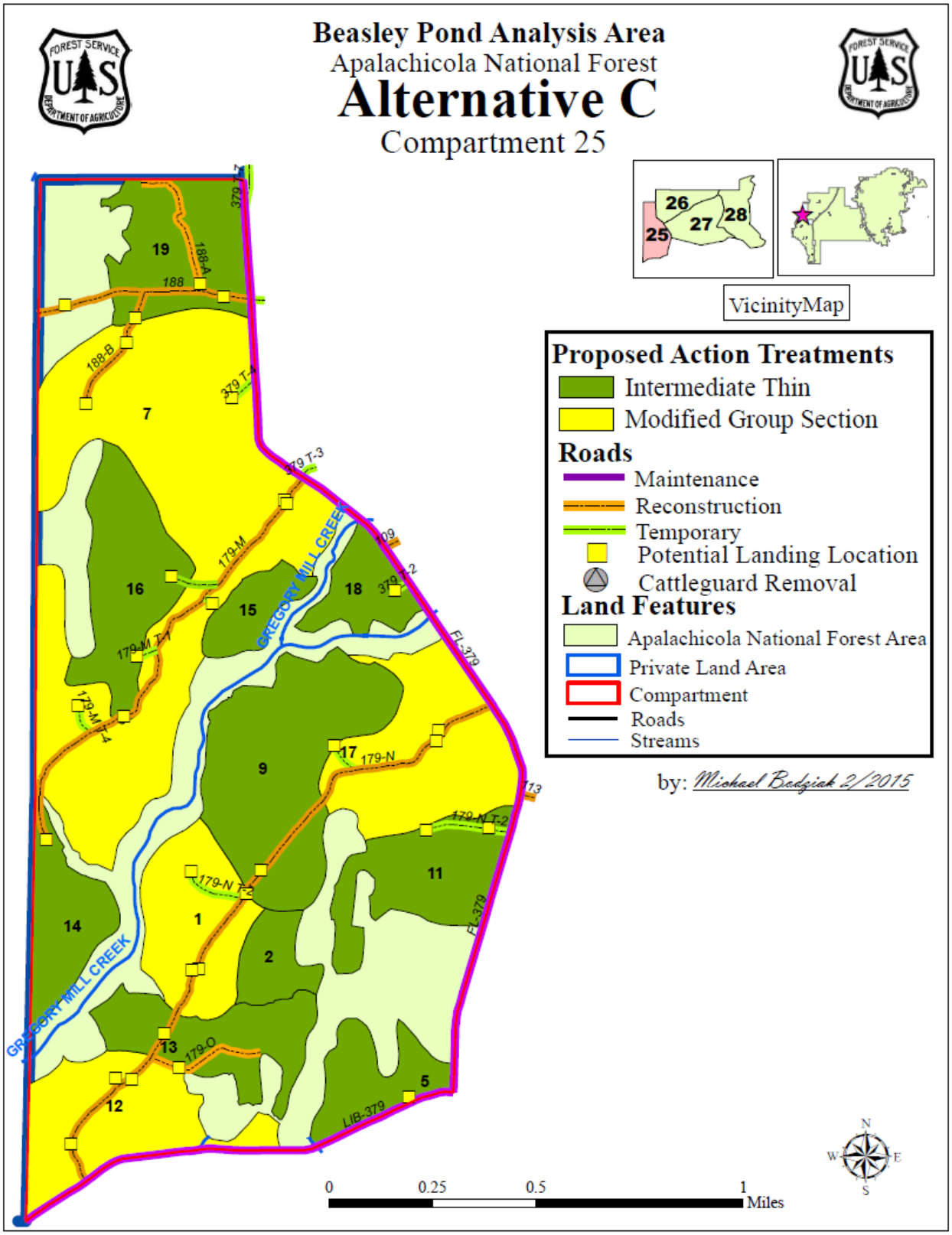


Figure 16. Alternative C Compartment 26 Proposed Treatment Map

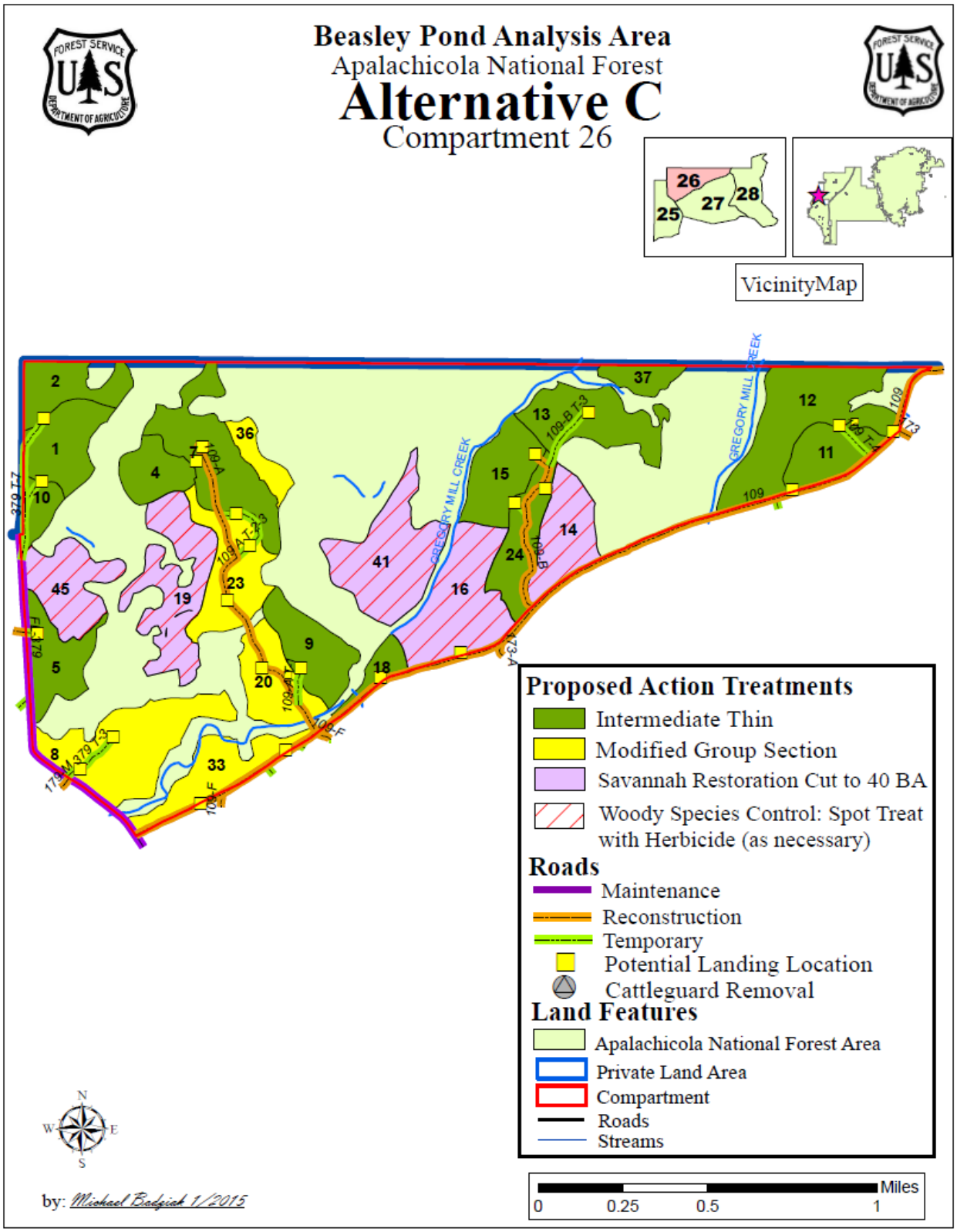


Figure 17. Alternative C Compartment 27 Proposed Treatment Map

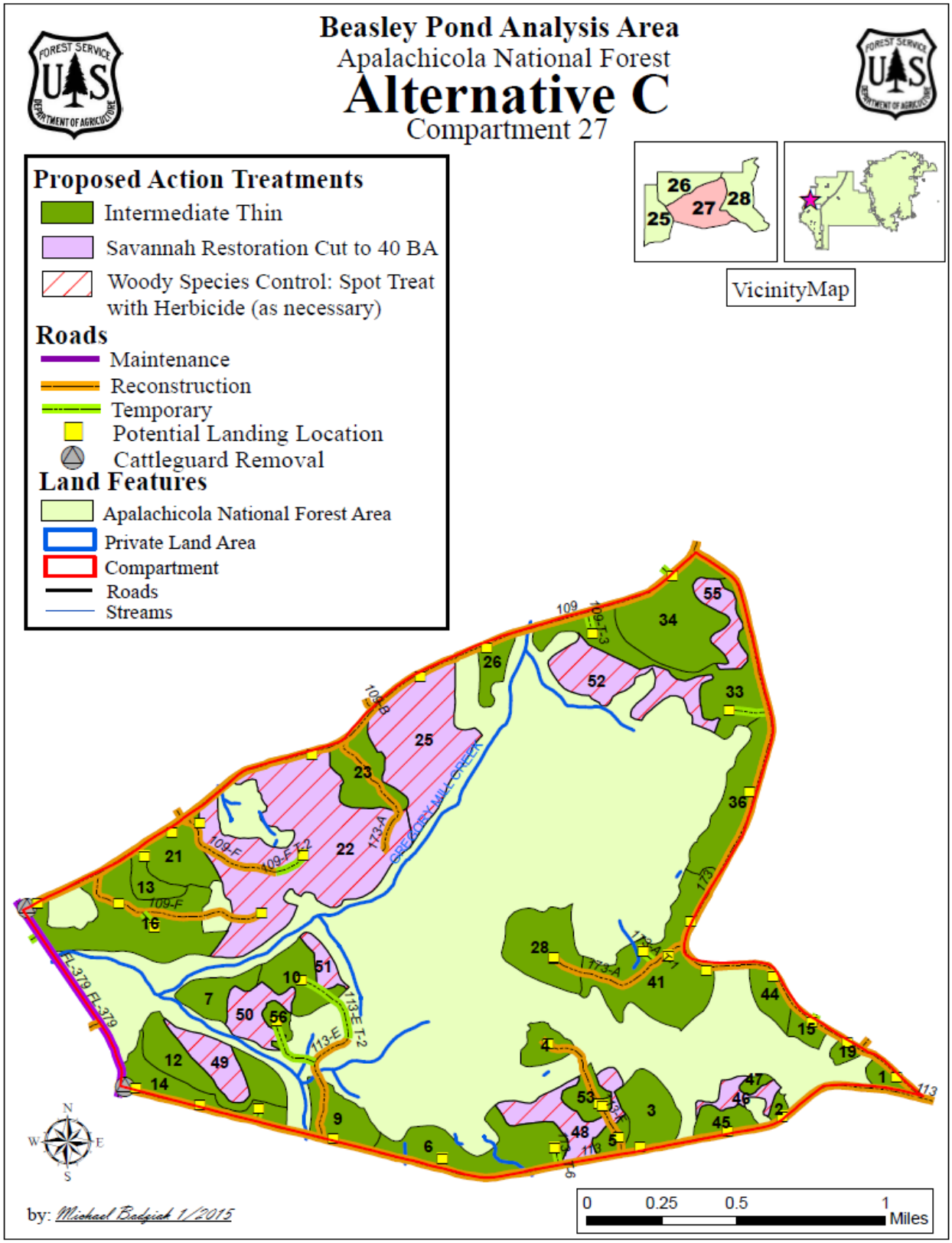
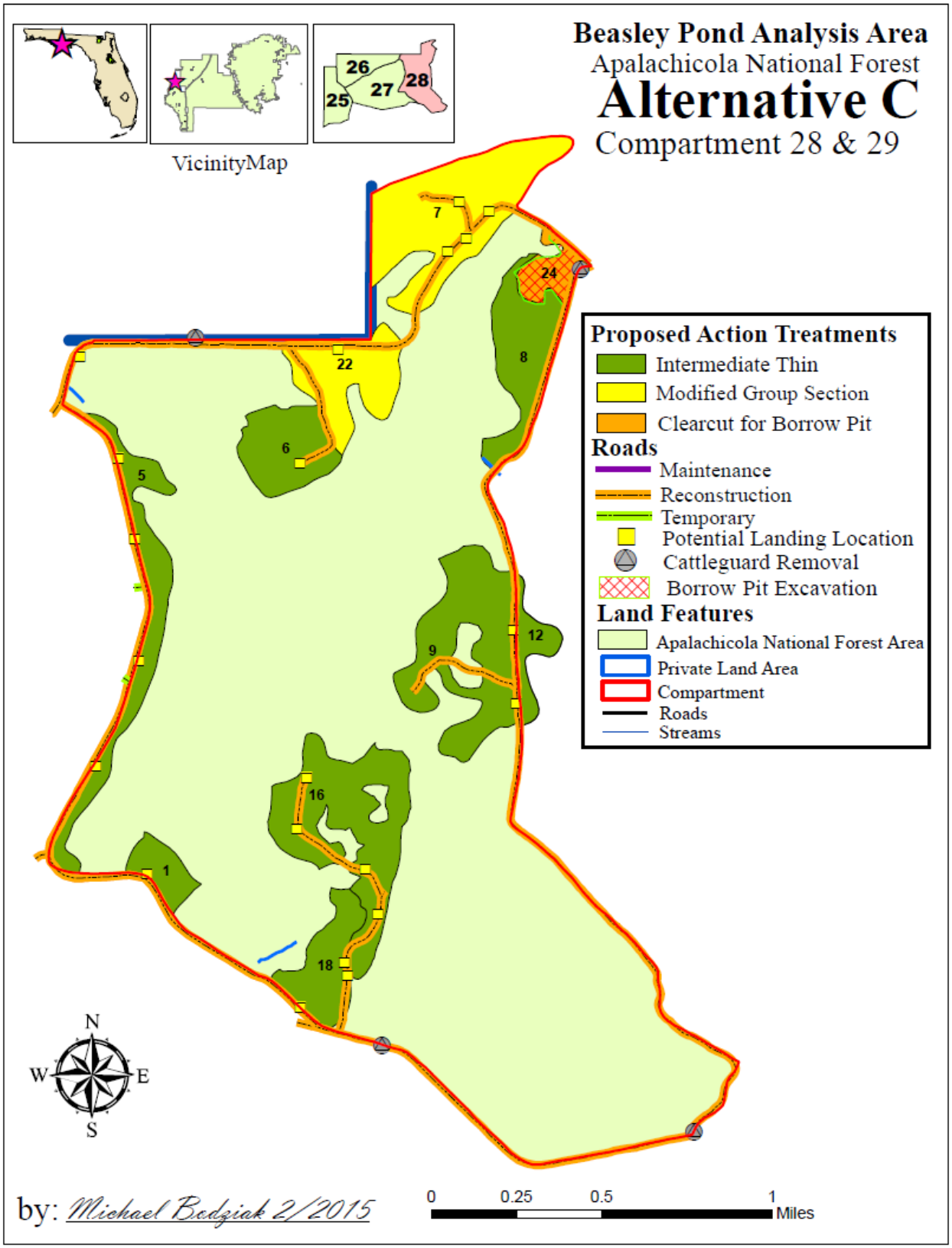


Figure 18. Alternative C Compartments 28 & 29 Proposed Treatment Map



Alternative D. No Herbicide

This alternative would include all actions described in the proposed action except herbicide use. The desired condition would be achieved by using handtools to control woody species in proposed wet savanna treatment areas. A detailed list of Alternative D actions includes:

- First or intermediate thinning of approximately 2068 of slash and longleaf pine stands. Stands range in age from 25 to 141 years old. Younger slash and longleaf pine plantations have a basal area (BA) ranging from 70 to 173 square-feet per acre. Thinning these stands would reduce the BA to an average of 50 square feet per acre thus opening the stands for sunlight penetration needed for continued growth and groundcover establishment.

- Conduct uneven-aged management cuts on 833 acres of mature longleaf pine. Openings ranging from ¼ -2 acres (average size of ½ acre) in size will be created throughout the stand to encourage natural regeneration of longleaf pine seedlings.

- Wet savanna restoration treatments on approximately 811 acres of wet savanna sites. Girdling will be used in stands that cannot be accessed for traditional logging operations (stands 19 and 41 in compartment 26 and stand 37 in compartment 27). All of these sites have either been planted over with slash pine or have been encroached upon by woody brush species and hardwood tree species. To restore these wet savanna sites a variable residual BA strategy will be implemented with groundcover condition serving as the trigger point for thinning intensity. In portions of the stand where herbaceous groundcover is deemed sufficient the Forest Service proposes to thin to a residual BA of 10-30 square feet per acre of standing live timber. Sufficient groundcover is needed when thinning to a lower BA in order to continue the use prescribed fire as a means of maintaining the open park-like structure associated with wet savannas. When groundcover conditions are deemed less than adequate to carry fire the Forest Service proposes to leave a residual BA of 40 in order to allow needle cast to serve as primary carrier of fire across the stand.

- Woody species control on 811 acres of wet savanna sites. Woody species such as gallberry will be removed using handtools such as brush saws and mowers to promote herbaceous plant response.

- Clearcut 16 acres of slash pine plantation for borrow pit excavation to provide surface material for future road work.

- Remove six cattle guards from a closed cattle allotment (two on highway 379, two on FSR 113, and one on FSRs 174 and 109).

Connected actions necessary to facilitate the proposed action include maintenance of 7.5 miles of landlines, reconstruction of approximately 12.83 miles of system roads, temporary improvement and use of approximately 4 miles of non-system which provide access to pine plantations, and the maintenance of approximately 14.73 miles of system roads used to haul timber products from the analysis area.

Figure 19. Alternative D Compartment 25 Proposed Treatment Map

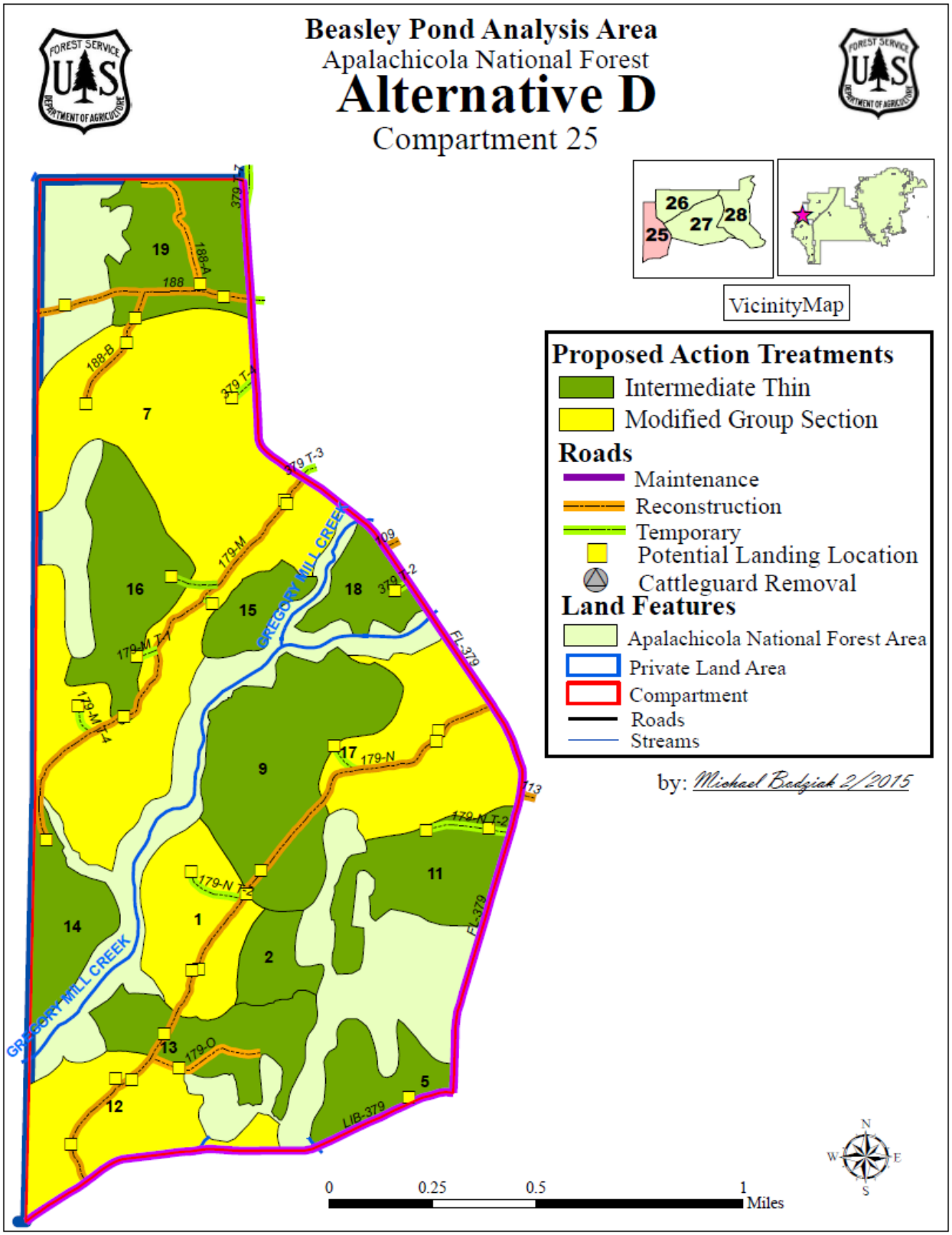


Figure 20. Alternative D Compartment 26 Proposed Treatment Map

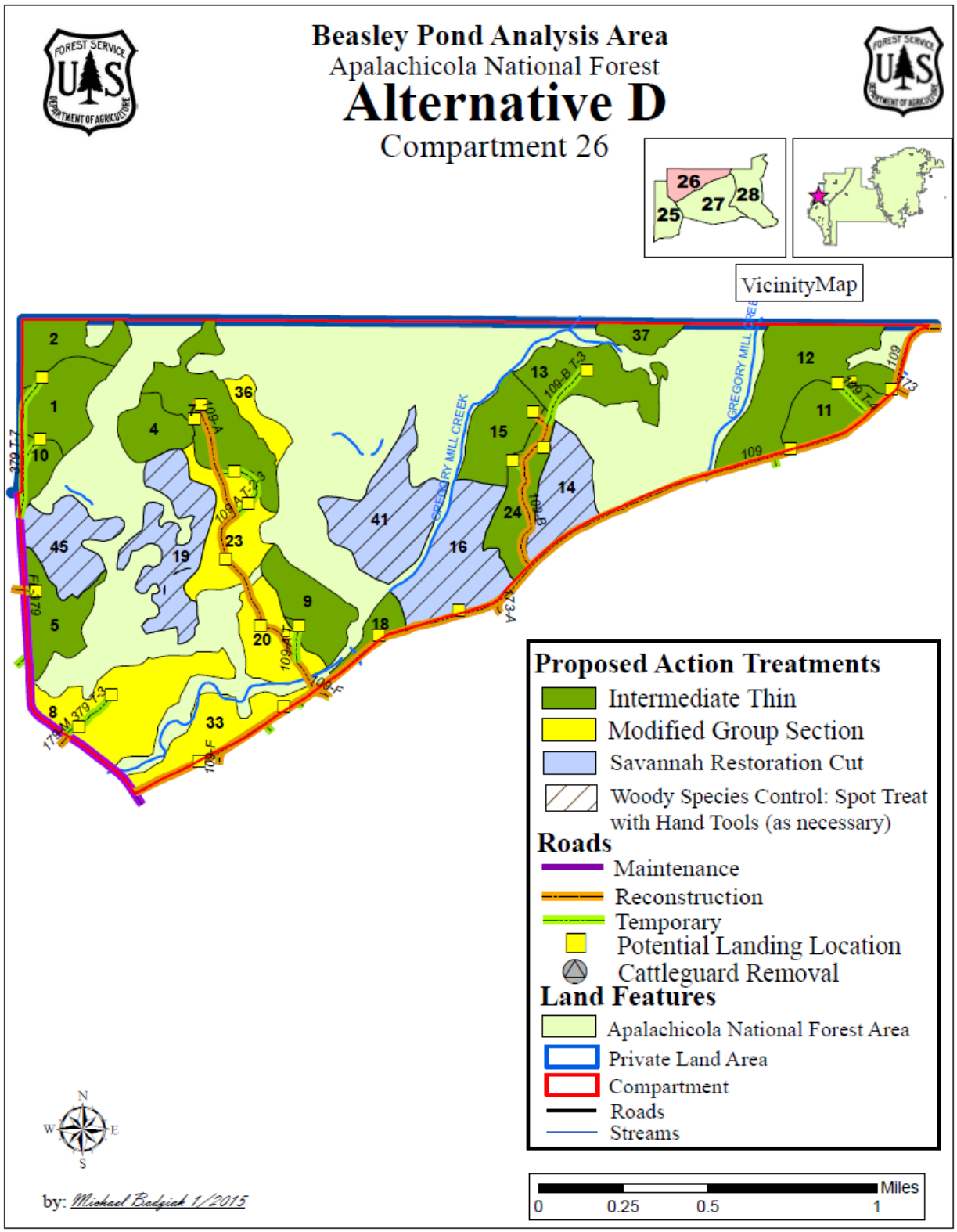


Figure 21. Alternative D Compartment 27 Proposed Treatment Map

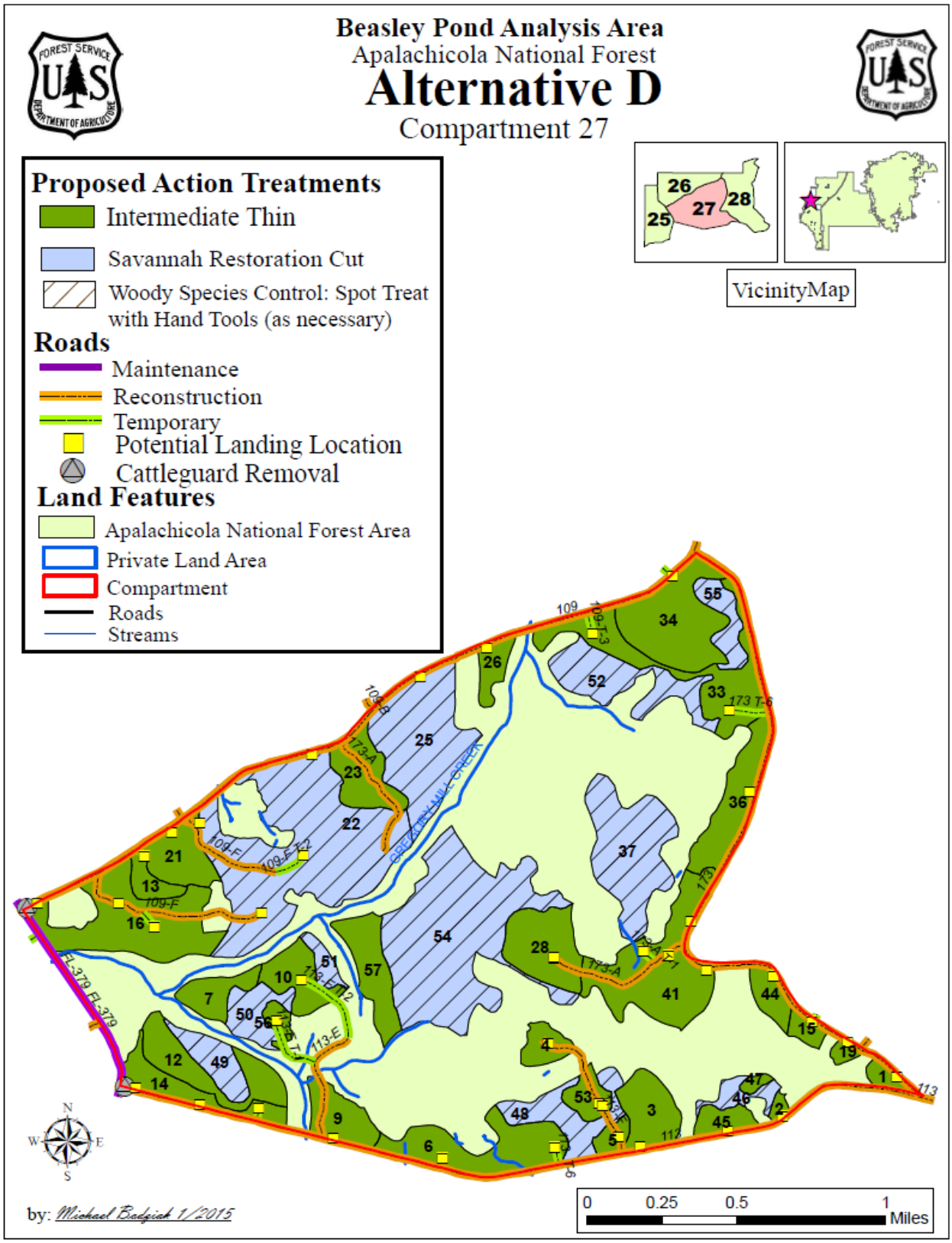
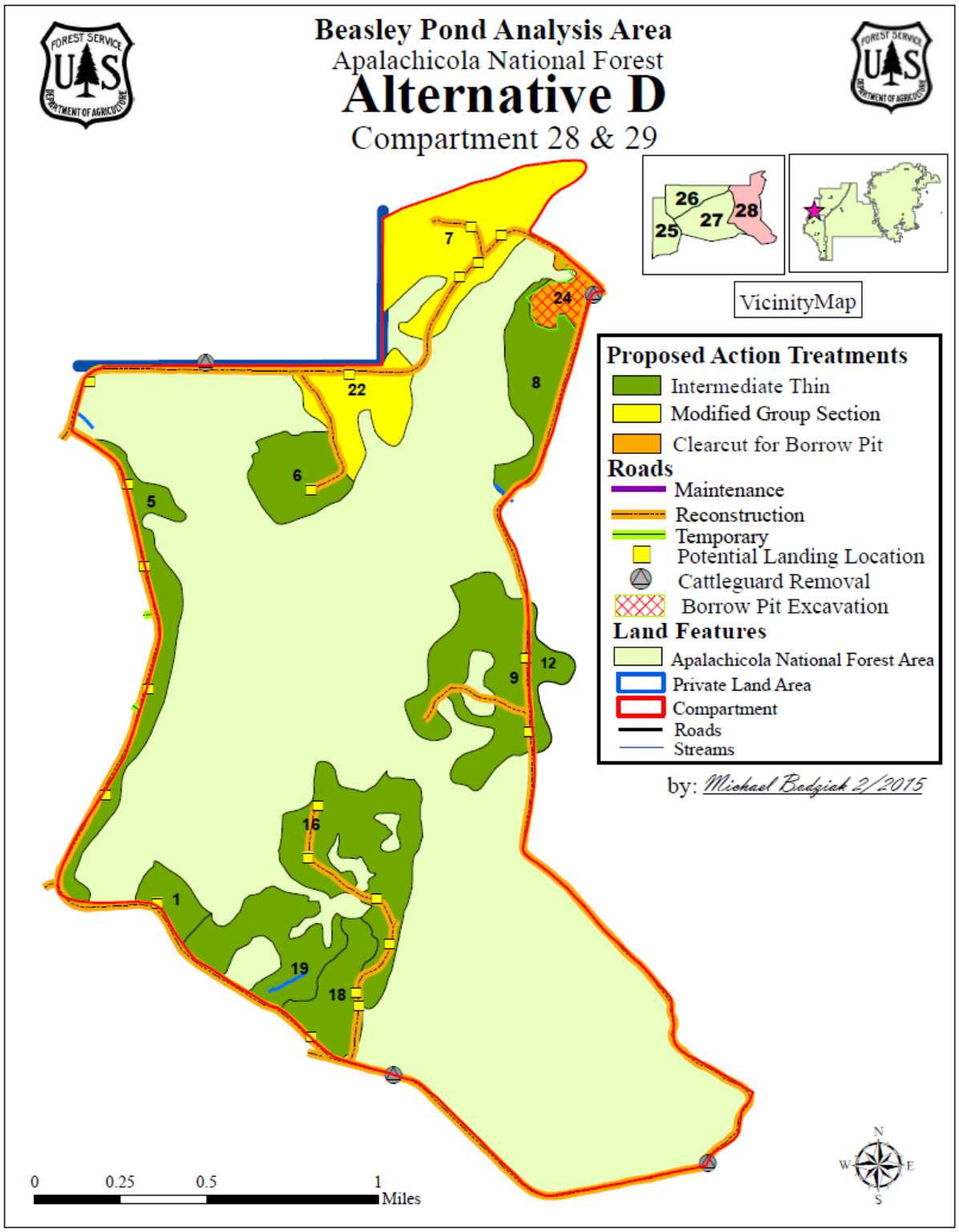


Figure 22. Alternative D Compartment 28 & 29 Proposed Treatment Map



Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of moving the analysis area desired condition and rehabilitating declining natural wet savanna site, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Eliminated Alternative 1 (No Wet savanna Treatments)

The interdisciplinary team discussed proposing treatments which did not include wet savanna restoration. All treatments were identical to the proposed action with the exception of savanna cuts. It was determined that not treating the wet savanna areas would not meet the purpose and need of ecosystem restoration in those areas and would not move the wet savanna stands toward the desired future condition identified on pages 12-18 of this EIS.

Coordination Measures (Applicable to Alternatives B, C, & D)

Coordination measures were incorporated into the design of all alternatives to reduce the risk of potential impacts to the physical, biological, and social-economic environments. These measures include all applicable Forest Plan Standards and Guidelines described below. Except where specifically noted, the analysis in Chapter 3 assumes that coordination measures would be followed.

Proposed, Endangered, Threatened and Sensitive (PETS) Species

- If modifications are made in the project, or if additional information regarding the effects of the project on listed species becomes available, the U.S. Fish and Wildlife Service (USFWS) would be notified and consultation would be reinitiated if the USFWS or the FS determines it is needed.
- There are isolated wetlands in the project area. Due to the poor condition of the harvest area, harvest would be allowed up to the ponds. Harvest will be restricted to these areas only when it is dry enough to allow for minimal soil disturbance.
    - There will be no timber harvest within 1500 feet of documented ponds during flatwoods salamander breeding season (October 1 – May 1) unless an exception is given by the Forest Service District Biologist.
        - Exceptions that allow timber harvest and associated hauling may be granted by the District Biologist in coordination with USFWS depending on weather. For example, logging could continue on into October through November if dry conditions persist and there have been no rain events that trigger movement to the breeding ponds. Also, logging may be able to resume in the spring if ponds have dried.
- If it becomes necessary to utilize Forest Service Road (FSR) 173 as a haul route during flatwoods salamander breeding season, the Forest Service would install culverts, silt

fence or other appropriate measures to allow passage of flatwoods salamanders across the road.

- Maintenance and hauling on FSR 173-A and FSR 109 T-5 will be done outside of the flatwoods salamander breeding season. These roads will be brought up to grade but will not be ditched.
- FSR 109 T-5 will be closed following timber harvest.
- Contracts would contain penalty clauses to protect white-banded RCW trees.
- Log decks should be located no closer than 200 ft. from RCW cavity trees. This cannot be avoided in all clusters in the project area due to hydric soil conditions. Exemptions needed are identified in the foraging analysis located in the Biological Assessment. Six clusters need exemptions for this activity.
- Timber and road contracts will prohibit harvest, hauling, and/or roadwork within active RCW clusters during the nesting season, April 1 through July 31. Exceptions will be made for hauling and/or roadwork on major numbered roads and highways (FS Level 5, 4, 3 Roads). Exceptions will also be made during nesting season if a biologist determines through direct observation that the cluster is no longer active, there is not a pair, or the young have fledged before July 31. This cannot be avoided in all clusters in the project area due to hydric soil conditions. Exemptions needed are identified in the foraging analysis located in the Biological Assessment. Nine clusters need exemptions for this activity.
- Purchasers and contractors will be educated in gopher tortoise burrow identification. In potential gopher tortoise habitat, prohibit locating log landings, designated skid trails, and parking equipment within 25 feet of known gopher tortoise burrows. Equipment operators will be instructed to maintain a 25 foot distance during operations when previously unknown burrows are encountered.
- Purchasers and contractors will be advised of the possible presence of threatened, endangered, and sensitive species and will be instructed to avoid harming any wildlife they encounter, including snakes.
- Equipment cleaning measures would be required by contracts to prevent the introduction or spread of non-native invasive plants.
- To protect aquatic species; pesticide application, timber harvesting activities, and road maintenance will adhere to the standards of Florida's Silvicultural Best Management Practices (BMPs). For a detailed discussion of these practices, see the Silviculture BMP Manual: http://freshfromflorida.s3.amazonaws.com/silvicultural_bmp_manual.pdf

Heritage Resources

- **HE-1** If any cultural resources are discovered during operations all ground-disturbing activity will cease. The Forest Archeologist will determine changes to be made to the project before work resumes (USDA 1999b).
- **HE-9** Known cultural resource sites will be protected by timber sale contract and no ground-disturbing activities will occur in these areas, which may include segments of roads (USDA 1999b).

Public Health and Safety

- Use herbicides in accordance with registration label. Place herbicide notice signs at treatment sites. Herbicide notice signs (FSH 7109.11) would be clearly posted, and would include the application date, the herbicide used, and safe reentry date. Private lands would not be treated. No herbicide would be applied within 100 feet of private land. No herbicide would be applied within 100 feet of any public or domestic water source.
- The Pesticide Use Handbook (FSH 2109.14) and the Health and Safety Code Handbook (FSH 6709.11) would be used as guidance for workers. Workers who apply herbicides would be trained to ensure minimum impacts and maximum effectiveness. Only those methods that assure proper application of herbicides would be used. Herbicide application by contract and/or in-house personnel would be performed by or directly supervised by the holder of a current Federal Pesticide Applicator's license following all current legal application procedures administered by the USDA Forest Service and the label on the herbicide container.

Soil & Water

- **WA-1** Adhere to standards of Florida's Silvicultural Best Management Practices (BMPs). For a detailed discussion of these practices, see the Silviculture BMP Manual: http://freshfromflorida.s3.amazonaws.com/silvicultural_bmp_manual.pdf
- **WA-2** Gregory Mill Creek is located within the analysis area (compartments 25, 26, and 27) and drains into Florida Creek. A 35-foot Special/Streamside Management Zone (SMZ) will be required in the following areas (LRMP, 3-24): compartment 25 Stands 1, 7, 12, 13, 14, 15, 17, 18; compartment 26 stands 8, 9, 13, 14, 15, 16, 27, 33; and compartment 27 stands 6, 7, 9, 10, 16, 22, 25, 26, 28, 37, and 41. No operation of heavy equipment will occur during periods when weather and soil conditions will promote excessive rutting or compaction.
- Forest Plan standard **WA-6** Restrict soil compacting activities, including logging traffic when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limits (USDA 1999b).

Vegetation

- **VG-37 -** Control invasive terrestrial and aquatic weeds. Do not apply herbicides within 60 feet of any PETS plant species unless analysis indicate herbicide use is the best way to protect PETS plants from invasive weeds (USDA 1999b). Contract specifications for equipment cleaning will be placed in contracts to prevent the introduction of exotic plants.
- Follow guidelines for planning and applying herbicides (USDA 1999a).
- **VG-19** – If herbicides are used for woody species control, use only spot grid or strip application or individual stem or directed foliar spray. Do not use herbicides for site preparation within 60 feet of any known PETS plant species, except where it is necessary to restore PETS habitat. Clearly mark buffers around PETS species so applicators can see and avoid them.

Visual Quality

- **VG-15 -** To enhance visual quality, require that slash, tops, and logging debris be piled no more than 2 feet high within 100 feet of levels A and B roads and designated trails. There are no stands within the analysis area that require visual mitigation.

Comparison of alternatives

Table 3 below summarizes the activities proposed under each alternative. Table 16 summarizes the effects of the alternatives that are described in Chapter 3.

Table 3. Comparison Table

Proposed Actions	Units	Alternatives			
		A	B	C	D
Improve Forest Health:		No Action	Proposed	Modified Stand Treatments	Without Herbicide
Thin pine slash and longleaf pine stands to open forest floor and promote herbaceous groundcover	Acres	0	2068	1961	2068
Borrow Pit Excavation	Acres	0	16	16	16
Create multiple age stand through uneven-aged management techniques	Acres	0	833	833	833
Rehabilitate and Maintain Wet savanna Sites					
Conduct wet savanna restoration treatments (10-40 residual BA)	Acres	0	811	0	811
Conduct wet savanna restoration treatments (40 residual BA)	Acres	0	0	670	0
Reduce hardwood competition (spot treatment as needed) with triclopyr	Acres	0	811	670	0
Reduce woody species competition (handtools/ mechanical as needed)	Acres	0	0	0	811
Transportation:					
Road maintenance for timber sale	Miles	0	14.73	14.73	14.73
Road reconstruction to haul timber removed	Miles	0	13.3	13.3	13.3
Reconstruction of existing non-system roads	Miles	0	4.0	4.0	4.0
Forest Product Outputs:					
Merchantable Sawtimber	CCF	0	17,267	16,338	17,267
Merchantable Pulpwood	CCF	0	17,444	16,089	17,444
Product Value	Dollars	$0	$1,845,003	$1,732,115	$1,845,003

Chapter 3. Affected Environment and Environmental Consequences

This chapter summarizes the physical, biological, social and economic environments of the project area and the effects of implementing each alternative on that environment.

Physical Environment

Soils

Affected Environment

The analysis area includes over 20 general soil series as described in *Soils and Vegetation of the Apalachicola National Forest* (USDA 1984). As noted in the following table, erosion hazard for these soils are slight, but due to their poorly drained conditions rutting by heavy equipment can occur.

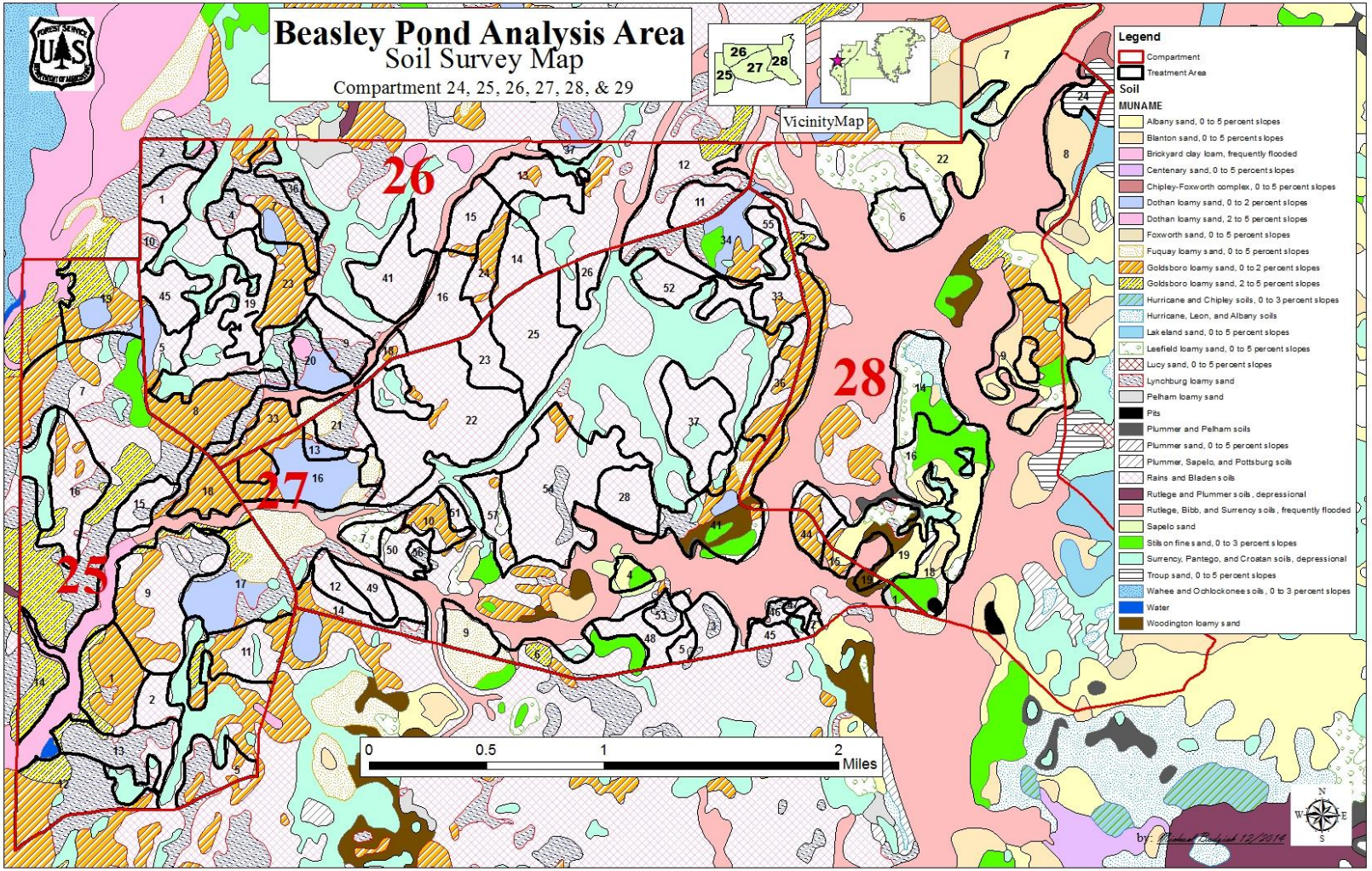
Table 4. Soil Series

Soil Series	Acres of Soil in the Analysis Area	Acres Treated in Proposed Action	Drainage Class	Drainage Description	Erosion Hazard	Equipment Limitation
Albany	303	182	3	Somewhat poorly drained	Slight	Moderate
Blanton	165	71	3	Moderately well drained	Slight	Moderate
Brickyard	89	12	7	Very poorly drained	Slight	Moderate
Chipley	1	1	3	Somewhat poorly drained	Slight	Moderate
Dothan	190	176	2	Well drained	Slight	Moderate
Foxworth	14	6	3	Moderately well drained	Slight	Moderate
Fuquay	118	111	2	Well drained	Slight	Moderate
Goldsboro	933	798	3	Moderately well drained	Slight	Moderate
Hurricane, Leon, and Albany	27	15	4	Somewhat poorly drained	Slight	Moderate
Lakeland	52	6	2	Excessively drained	Slight	Moderate
Leefield	155	127	2	Somewhat poorly drained	Slight	Moderate
Lynchburg	524	436	3	Somewhat poorly drained	Slight	Moderate
Pelham	20	3	8	Poorly drained	Slight	Moderate
Pits	7	2	5	Very poorly	Slight	Moderate

Soil Series	Acres of Soil in the Analysis Area	Acres Treated in Proposed Action	Drainage Class	Drainage Description	Erosion Hazard	Equipment Limitation
				drained		
Plummer and Pelham	43	5	3	Poorly drained	Slight	Moderate
Rains and Bladen	2286	1533	3	Very poorly drained	Slight	Moderate
Rutlege, Bibb, and Surrency	1007	52	5	Moderately well drained	Slight	Moderate
Stilson	139	118	6	Very poorly drained	Slight	Moderate
Surrency, Pantego, and Croatan	622	64	6	Well drained	Slight	Moderate
Troup	29	15	3	Poorly drained	Slight	Moderate
Woodington	62	30	6	Poorly drained	Slight	Moderate

Environmental Effects: Maintaining landlines, girdling pines, and removing wire fencing & stays would have no effect on the soils in this analysis area. Therefore, these actions are not discussed under each alternative.

Figure 23. Soils Map



Alternative A—No Action
Slight soil movement would also occur as a result of ongoing forest management. The effects of prescribed burning on soils would create a short-term reduction in litter and duff. This effect would be short-lived (2-5 months) and over the long term would aid in increasing the mineral content of the soil (Certini 2005). Burning may result in short term changes in soil chemistry of the surface layer due to the release of nutrients in soil litter (USDA 1999a). The effects of fire are rarely cumulative, with soil conditions returning to pre-burn conditions within two years. Previous firelines would be maintained causing a limited amount of soil disturbance. The effects of road maintenance would also cause soil displacement. The existing soil erosion would persist, thus decreasing soil productivity and stability over time.

Cumulative Effects
The forest wide prescribed burn program would continue to occur under Alternative A. Prescribed fire provides benefits such as renovation of dominant species, where conditions allow, and increase available nutrients (Certini 2005). Soil erosion may occur with severity being determined by vegetation composition and hydrology of the area. Non-native invasive species treatments will continue throughout the forest, but will mostly be done in and near road rights-of-way. The treatment of frosted flatwoods salamander and striped newt habitat would also occur throughout the project area in and around designated breeding ponds under the Isolated Wetlands EA (signed 2012). Treatment includes using handtools and herbicide to remove hardwood vegetation. These treatments are not expected to cause a significant impact to soils when combined with previously discussed activities under Alternative A. No other past, present or future management activities were identified that would cumulatively impact soils under Alternative A.

Alternative B—Proposed Action (Preferred Alternative)
Road reconstruction and maintenance would create the highest potential for soil movement under this alternative. The associated roadwork may cause an increase in soil erosion and run-off. "Erosion removes mineral particles, organic matter, and nutrients from the soil, reducing its thickness and water-holding capacity. Eroded soil then may become a pollutant in streams and reservoirs" (Singer and Munns 1991). Road design features would generally control the amount of erosion and control it's occurrence through appropriate drainage features. Surface erosion associated with roads usually decreases rapidly once road construction is complete with little signs being found 3-5 years following road construction/reconstruction (Grigal 2000). Temporary roads would be closed to the public and allowed to naturally re-vegetate thereby reducing erosion risk. In these areas enhanced growth would occur due to lack of competition along the road prism. More information regarding the impacts of road reconstruction and maintenance on soils can be found in the Forest Plan's FEIS.

Some soil will be displaced during the logging operations when skidders and other heavy equipment traverse across the land especially when skidding logs. Soil factors such as dryness, organic matter present, and soil depth influence the degree of compaction. The greatest impact on soils from logging usually occur under wet soil conditions (Williamson and Neilsen 2000). Under action alternatives harvesting activities would be restricted during times of excessive moisture. Under drier soil conditions compaction would not occur at levels that would restrict root growth. Soil surface mineral loss has also been found to occur following harvest operations (Nave and others 2010). The effects however were found not to be permanent.

In areas where soils have severe equipment limitations, such as wet savanna sites, the following restriction would be applied to minimize the effect of silvicultural practices: Restrict soil compacting activities, including logging traffic – on Bladen, Eureka, Iberia, and Megget soil series when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limits. The analysis area contains approximately 2,286 acres of Rains/Bladen soils.

Under this alternative, no soil movement would occur during woody species control, which would be done using approved herbicides. The herbicide triclopyr is prescribed for woody species control. This herbicide is not soil active. It is generally non-mobile in soils, though gross applications (spills) or misapplications may show some mobility. Any pesticide can be transported from the soil at the application site by runoff, sediment loss, or percolation. The amount of pesticide not washed away in runoff will penetrate the soil column with depth of penetration depending on the properties of the chemical and soil (SERA 2011). Triclopyr has a moderately short half-life of 10-46 days with an average of 30 days. It is degraded both by soil microbes and by photolysis (SERA 2011).

Wind erosion can be a transport mechanism for herbicides in soil. The degree of movement is largely site-specific (SERA 2011). The amount of triclopyr that might be transported by wind erosion depends on "application rate, depth of incorporation into the soil, persistence in the soil, wind speed, and topographical and surface conditions of the soil" (SERA 2011).

The environmental consequences of this herbicide are also discussed in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Costal/Piedmont, Volume I and in the SERA report.

Borrow pit excavation is proposed to take place on approximately 16 acres in the northeastern section of the analysis area. The area is comprised of the troup soil series that is a very deep and moderately permeable soil. Excavation would compact the soil within and around the proposed borrow pit site. Nutrient leaching and erosion are common occurrences during early phases of pit excavation. Borrow pit design mitigation will be implemented to minimize soil movement issues. The proposed pit would be used for the Beasley Pond area as well as future project needs in the immediate area. This would mean degraded soil conditions for 10-15 years in and around the excavation site. Cattle guards associated with an abandoned cattle allotment will be removed under the proposed action. The removal of these guards would not adversely affect soils in the area.

Cumulative Effects

The forest-wide prescribed fire program will be executed in conjunction with Alternative B. Prescribe burning shortly after harvesting operations have been completed could increase soil erosion and leaching of soil nutrients. The use of herbicide for the control of non-native invasive species and salamander/striped newt habitat improvement will continue throughout the forest. Herbicide use in conjunction with borrow pit excavation could result in offsite movement of herbicides. Aust and Blinn (2004) concluded that forest harvesting in conjunction with other management activities in steeper regions resulted in erosion and leaching that fell below acceptable values for land use. Given the flat topography of the project area and the Forest

Service's experience using similar treatments the agency does not expect significant cumulative soil impacts.

Alternative C - Reduced direct impacts on threatened and endangered species
Soil effects under alternative C are nearly identical to those of alternative B. Across the analysis area, impacts to soils would be less than that of the proposed action due to the removal of three stands under this alternative (stands 54 and 57 in compartment 27 and stand 19 in compartment 28). Thinning to 40 BA in all proposed wet savanna restoration stands would result in soil compaction but to a lesser extent than alternatives A and B due to fewer passes of heavy equipment to harvest trees.

Cumulative Effects
Cumulative effects would be similar to those in Alternative B.

Alternative D – No Herbicide
Soils effects from logging, road work, and borrow pit excavation are similar to alternatives B and C. Woody species control would be conducted using handtools such as brush saws, rather than herbicide, under this alternative. Brush saws would cause minimal impact to soils in proposed wet savanna stands. Larger mechanical mowers would result in rutting and soil compaction if conducted in unfavorable conditions such as excess soil moisture. Mitigation measures will be incorporated in all woody control contract specifications to insure soil compaction and erosion are minimized (see coordination measures pages 30-31).

Cumulative Effects
Cumulative effects would be similar to those in Alternatives B and C.

The environmental effects identified for soils under each alternative are also discussed in the FEIS for the forest plan (pages 3-9 through 3-15). Soil compaction, rutting, erosion, and sedimentation are all identified in the FEIS for the Forest Plan as adverse effects to soils due to harvest of timber on national forest land. The activities proposed under Alternative B, C and D are not expected to exceed evaluated levels in the FEIS.

Water Quality

Affected Environment
Beasley Pond Analysis Area falls within the boundaries of the Apalachicola River Watershed. This watershed is approximately 149,689 acres within the western boundary of the forest. In Florida, there is not a sharp distinct difference between watershed boundaries. The land is mostly flat to gently rolling and watersheds are generally broad and meandering.

The watershed is drained primarily by Gregory Mill Creek, which runs adjacent to 25+ stands in the analysis area. These stands are separated from the stream by hardwood or vegetative stringers. There are no known background water quality tests that have been completed within this area.

Alternative A – No Action
Current water quality conditions would persist under the No Action Alternative. Prescribed burning and non-native invasive species treatments would continue throughout the area.

Cumulative Effects
Recurrent road maintenance may have a temporary effect on soil stability potentially causing runoff into adjacent waterbodies. Ongoing prescribed burning temporarily removes the surface organic layer which could lead to storm runoff and a decrease in water infiltration into the subsoil. Burning also has the potential to significantly change nutrient concentrations in stream water but changes would not significantly affect water quality (Gottfried and DeBano 1990) and (Douglass and Van Lear 1983). Plowed firelines also can interrupt overland waterflow in riparian areas and transition zones, slightly altering hydrology. The continued treatment of woody vegetation under the Isolated Wetlands EA could continue throughout the area. Removal of woody vegetation could result in an increase in hydroperiods for breeding ponds. Such an alteration in hydrology would not significantly impact water quality throughout the analysis area.

Alternative B – Proposed Action (Preferred Alternative)
Under this alternative, the water table may rise temporarily after harvesting trees. This increase would be due to vegetation removal, which contributes to water loss through evapotranspiration. Runoff from heavy rainfall could contribute to soil movement. This effect would be more prevalent around the borrow pit excavation site than in stands proposed for thinning. The erosion of soil and subsequent deposition reduce productivity and pollute water (Singer and Mumm, 1996). If any intermittent streams were located during sale layout, a buffer would be established to act as a filter to soil movement.

- A 35-foot Special Management Zone would be required in the following areas: compartment 25 – stands 1, 7, 12, 13, 14, 15, 17, 18; compartment 26 – stands 8, 9, 13, 14, 15, 16, 27, 33; and compartment 27 – stands 6, 7, 9, 10, 16, 22, 25, 26, 28, 37, 41. The zone would be designated on either side of the stream, to protect poorly drained soils from rutting or compaction and to reduce sediment load to the creeks and wetlands from harvest activities.
- No operation of heavy equipment would occur during periods when weather and soil conditions would promote excessive rutting or compaction.
- Restrict soil-compacting activities, including logging traffic – on Bladen, Eureka, Iberia, and Megget soil series when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit.

Borrow pit excavation has the potential for groundwater contamination once excavation has been completed. This is due to the relatively high water table and flat topography in the area (Martin and others 2001). The removal of old cattle guards would allow for a more natural flow of water in the analysis area.

In this alternative, triclopyr is proposed for woody species control in wet savanna stands. For terrestrial applications of triclopyr the greatest risk of exposure is associated with acute and longer-term consumption of contaminated fruit and vegetation (SERA 2011). Exposures associated with consumption of contaminated water are considerably lower. The primary

pathway for degradation for triclopyr in water is photodegradation. No herbicides would be applied within 100 feet of private property.

All herbicides would be applied in mixture as a foliar application, at less than half the application rate approved by the manufacture's labels. The application rate would be applied according to the product labels, and would meet the requirements of the SERA report.

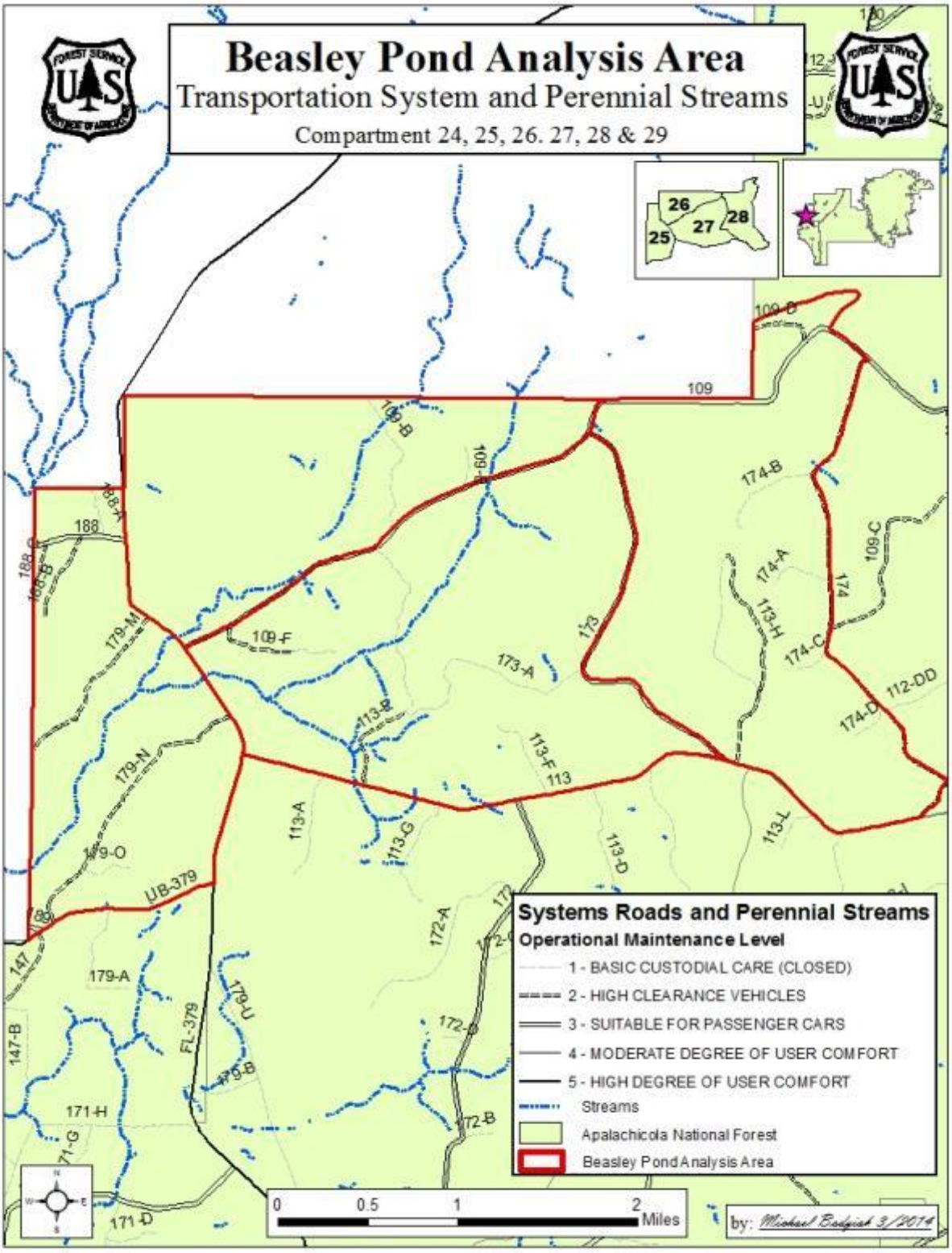
Cumulative Effects
Prescribed burning, road maintenance, non-native invasive species treatment, and flatwoods salamander and striped newt habitat improvement treatments would continue to occur in conjunction with activities proposed in Alternative B. Each activity will vary in time and method of application, and duration. The environmental effects identified for water quality are also discussed in the FEIS for the forest plan (pages 3-9 through 3-15). Cumulative impacts associated with Alternative B and ongoing forest management is not expected to exceed impacts identified in the FEIS.

Alternative C - Reduced direct impacts on threatened and endangered species
The environmental effects of Alternative C are the same as Alternative B except that there would be no potential impacts to water quality due to the use of herbicides.

Cumulative Effects
Cumulative effects would be similar to those in Alternative B without the potential impacts to water quality from the use of herbicides.

Alternative D – No Herbicide
Under this alternative, effects to water quality from harvesting timber would be similar to those in alternatives B and C. The use of handtools for woody species control would have no significant effect on water quality.

Figure 24. Transportation and Waterbody Map



Air Quality

Affected Environment

Air pollution is the presence in the atmosphere of one or more contaminants of a nature, concentration, and duration to be hazardous to human health or welfare (Sandberg and others 1990). Air quality is a measure of the presence of air pollution. Ambient air quality is defined by the Clean Air Act as the air quality anywhere people have access to, outside of industrial site boundaries.

The Florida Department of Environmental Protection (DEP) is responsible for inventory, monitoring, and regulation of air quality. Areas are divided into air quality classes. In Class I areas, fresh air (lack of odor) is a recognized value of the area and very little air pollution is allowed. Class II areas allow a moderate level of air pollution to accommodate industrial/urban development. National Ambient Air Quality Standards (NAAQS) were set by the Environmental Protection Agency to promote a level of air quality sufficient to protect public health and welfare issues.

The Beasley Pond falls within Air Quality Class II area, which allows a reasonable amount of air pollution. Prescribed fire has been a part of management of this analysis area for many years. These compartments have been prescribed burned several times in the past. The table below shows the history of prescribed burning in these compartments in the last ten years. The analysis area currently meets National Ambient Air Quality Standards.

Table 5. Prescribed Burn History (Acres Burned) 2004-2014

COMP	FY-2014	FY-2013	FY-2012	FY-2011	FY-2010	FY-2009	FY-2008	FY-2007	FY-2006	FY-2005	FY-2004
25		1,141				1,141			1,141		
26		1,115			1,115		1,115				1,115
27		1,708				1,708		1,708			1,708
28			1,001			1,001				1,001	
29			1,132			1,132			1,132		1,132

Alternative A—No Action

Prescribed burning would have a temporary effect on air quality. Smoke created as a result of prescribed burning is managed and analyzed as part of each burn plan. The Apalachicola National Forest follows the National Forest Smoke Management Guidelines to minimize the effects. The dust created as a result of the roadwork is managed and analyzed as part of the road maintenance agreement. These management activities will result in a temporary (1-3 hours) reduction in air quality in areas directly adjacent to roadwork activities. Landline maintenance would have no effect on air quality.

Cumulative Effects

Road maintenance and prescribed burning activities continue to occur around the analysis area. Road maintenance would temporarily reduce air quality in the immediate area. Effects of road

maintenance are not expected to cause significant cumulative effects when paired other ongoing management activities in the area.

The cumulative impact of the no action alternative would create indirect effects over time on forest vegetation and litter, or "fuel loadings", and the resulting effect on wildfires. In the absence of prescribed burns brushy species replace grasses and fuel loading increases. Wildfires occurring in areas with increased fuel loadings produce more smoke and are more difficult to contain and therefore often burn for longer durations. Wildfires may occur at times when wind carries smoke into sensitive areas, and at times when smoke dispersal is poor.

Each prescribed burn on the District is planned, designed, and implemented to avoid smoke impacts to downwind sensitive areas. The planning and implementation of each burn complies with the Florida Smoke Management Program Requirements and the Regional Smoke Management Guidelines. The purposes of smoke management programs and guidelines are to mitigate the nuisance (such as impacts on air quality below the level of ambient standards) and public safety hazards (such as visibility on roads and airports) posed by smoke intrusions into populated areas; to prevent significant deterioration of air quality of Class I areas, and to insure that National Ambient Air Quality Standards (NAAQS) are complied with. Potential smoke emissions from the prescribed burns are evaluated using the Fire Emissions Production Simulator (FEPS) and the dispersion models VSMOKE-GIS and HYSPLIT[1/] to estimate direction of smoke dispersion and downwind concentrations prior to implementing the burns. These requirements and guidelines are the best practices available to avoid and minimize impacts to public health and visibility impairment on highways (safety). The FEIS for the Forest Plan identifies prescribed burning as creating the greatest impact on air quality than any of management activity occurring on the National Forests in Florida. The FEIS also states that "prescribed burning has not been limited by air quality standards for particulate matter. There are no documented areas in rural Florida that do not meet air quality standards for particulate matter" (USDA 1999a, p. 3-5).

Alternative B—Proposed Action (Preferred Alternative)
Timber harvesting operations, prescribed burns, and the associated roadwork activities would require heavy equipment to operate on the site. Heavy equipment operation would release emissions and create dust while in operation. Local weather patterns would aid in dissipating dust after each day of operation. Effects from dust for example would in most cases occur for less than a few hours, while smoke from prescribed fires could be present for several days. Timber harvesting would occur during dry periods or when stand conditions permit operability. Prescribed burning would occur during growing or dormant seasons. Growing season burns usually produce smoke that is darker and thicker. This is due to the moisture content of the leaves and understory vegetation. Depending on environmental conditions such as wind speed and direction, temperature, humidity, and other factors, the smoke from the prescribed burning may adversely affect the visibility on roads. This would only be a temporary effect.

Caution signage and/or flashing warning lights on major highways and roads would minimize the effect. In the event of severe smoke in heavily congested areas, Forest Service personnel are strategically stationed in areas of concern.

The use of herbicides is not expected to affect air quality since application would only occur when wind speeds are less than 8 miles per hour to reduce chance of wind drift. In instances where wind gusts of over 8 miles per hour occur drift of herbicide could affect air quality.

Cumulative Effects
A potential cumulative effect to air quality could occur if prescribed burning in adjacent compartments occurs at the same time as the road reconstruction, maintenance, and or timber harvesting. Primary concerns from smoke and or dust from harvesting would be to adjacent landowners and traffic on nearby roadways. Duration of air quality impacts from each prescribed burn is generally short-term (1 day or less); smoke disperses within a few hours. Burn ignition is normally completed within 4 to 6 hours and active burning is complete within an hour or two after ignition is stopped.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to air quality under Alternative C would be similar to those under Alternative B.

Cumulative Effects
Cumulative effects would be similar those found under Alternative B.

Alternative D – No Herbicide
Harvest activities would have impacts similar to those in Alternatives B and C. The use of handtools or other mechanical equipment for woody species control would produce dust and exhaust in localized areas and will usually last 1-12 hours.

Cumulative Effects
Cumulative effects would be similar those found under Alternative B and C.

Vegetation

Affected Environment
The analysis area has young slash pine between 25-93 years old. The younger slash stands are in the form of plantations and have an average BA of 111. Older slash stands have an average BA of 108 and like the younger stands need to be released to allow for more crown diameter and stem growth. Longleaf pine stands within the analysis area range from 25-140+ years old. These stands are growing well but are in need of thinning (average BA of 100). Stands are also interspersed with hardwood and mixed pine/hardwood swamps and stream buffers.

Groundcover

The groundcover is mainly composed of wiregrass, saw palmetto, and gallberry, in combination with fetterbush, titi, wax myrtle, blueberry, sweetbay, huckleberry, or holly in the pine stands. In the proposed clearcut and borrow excavation stand the groundcover consists of saw palmetto, gallberry, and oaks with some infrequent spots of grasses and forbs. Surrounding the pine flatwoods are swamps, low areas and natural drainages that contain bottomland hardwoods. Pitcher plants, wiregrass, and an array of wildflowers are present in the understory of the better quality proposed wet savanna restoration areas. In wet savannas that have been planted over, woody species such as gallberry are present in patches interspersed throughout the stands.

Old-Growth

Some Old-Growth stands, as designated by the forest plan, are within the analysis area (see Table 7). The FEIS for the forest plan identifies old growth stands as "encompassing the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulation of large wood material, number of canopy layers, species composition, and ecosystem function" (USDA 1999a, p. 3-30). These old-growth stands were designated for the entire forest according to the guidance provided in Forestry Report R8-FR 62 (Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region) at the projected acreages for individual management area (described in the Forest Plan page 2-6). Many of the designated stands do not meet the old growth parameters in the report, but were designated because of their age and their likelihood of achieving future old growth characteristics. Management of these areas will occur in accordance with the Forestry Report R8-FR 62. Stand 24 of compartment 26 and stands 23 and 34 of compartment 27 have areas within their boundaries designated as old-growth. These stands are proposed for thinning in Alternatives B, C, and D. Old growth areas are not suitable for management for the purpose of timber production (Forest Plan Standard VG-40; USDA 1999b, p. 3.23), but harvest may be authorized to maintain old growth characteristics

Non-Native Invasive Species

A wide variety of non-native invasive species occur on the ANF. A complete inventory of the forest has not been conducted but many species, such as mimosa, Japanese climbing fern, and cogongrass are known to occur throughout the forest, mostly concentrated along roads and disturbed areas. As a coordination measure, contracts for timber sales, road reconstruction or maintenance, and site preparation that involve equipment would contain equipment cleaning clauses to reduce the risk of spread or introduction of exotic plants.

If a population of non-native invasive species is discovered in the analysis area it could be treated under the authority established in the Environmental Assessment for Non-Native Invasive Plant Control on the Apalachicola National Forest. The decision notice for this analysis was approved on 7/15/2004.

Figure 25. Beasley Pond Vegetation Map

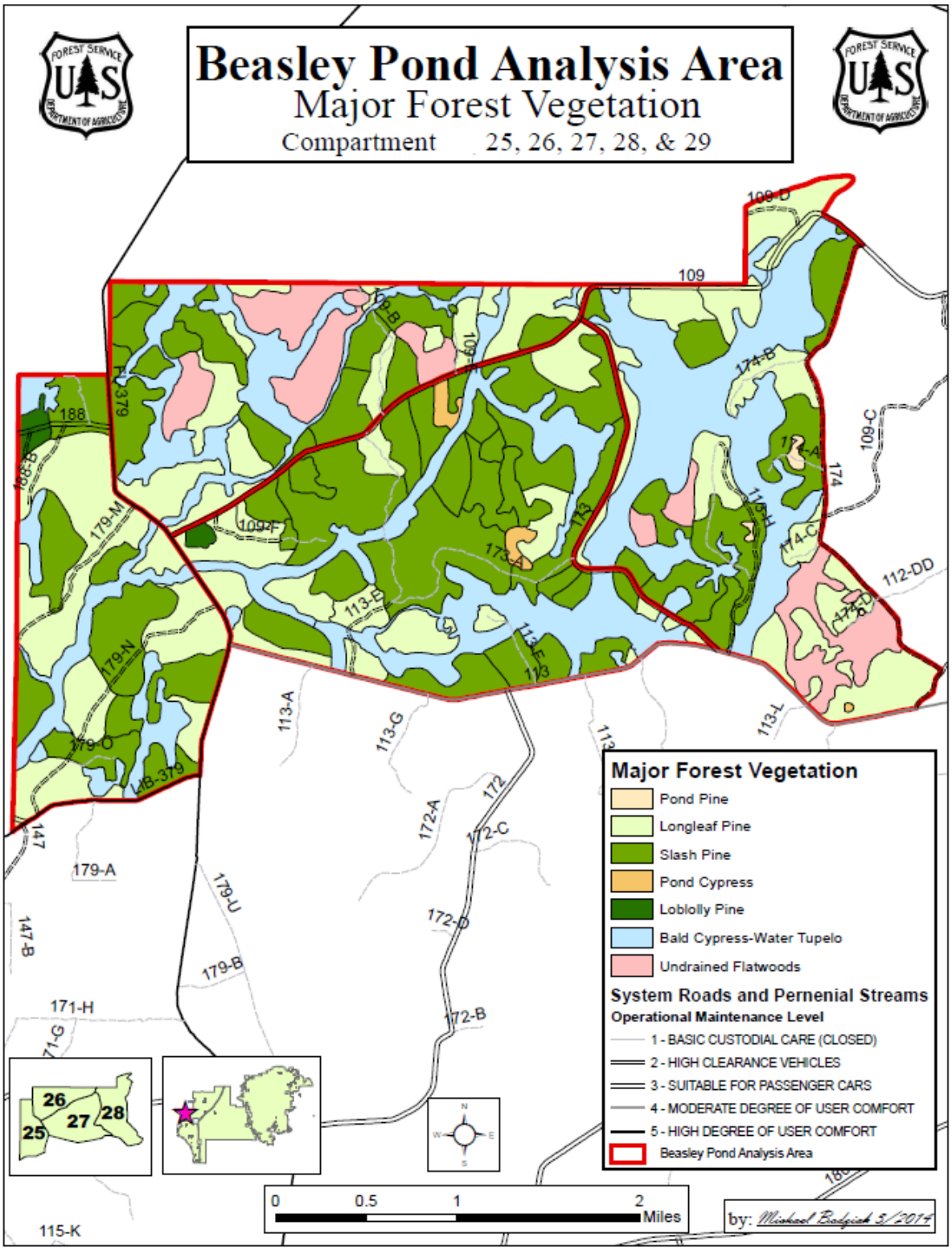


Table 6. Age Class Distribution by Forest Type

Forest Type	Acres by Age class														
	21- 30	31- 40	41- 50	51- 60	61- 70	71- 80	81- 90	91- 100	101- 110	111- 120	121- 130	131- 140	141- 150+	Total	Percent
Pond pine-hardwood							12							12	1
Longleaf Pine	34		140	41		98	985	58		29	29		58	1,471	41
Slash Pine	76	472	443	483	139	428	16	51						2,108	59
Pondcypress							1							1	1
Loblolly Pine						25								25	1
Bald Cypress-Water tupelo							100	85						185	1
AC	110	472	583	523	139	552	1115	200		29	29		58	3709	**Total**
%	4	14	17	15	4	16	29	4		1	1		2	100	**Percent**

Table 7. Designated Old-Growth Stands within Beasley Pond Analysis Area

Old Growth Type	Comp.	Stand	Acres	Age	Forest Type	Proposed Treatment Alts. B, C, and D
Southern Wet Pine Forest, Woodland, and Savanna Old-Growth Forest Community Type 29	26	24	29	118	21	Thin
Upland Longleaf and South Florida Slash Pine Forest, Woodland, and Savanna Old-Growth Forest Community Type 26	27	23	29	123	21	Thin
	27	34	58	141	21	Thin

Alternative A – No Action
Using the ecological condition model the Forest Service identified five ecological conditions in the Beasley Pond Analysis area: excellent, good, fair, poor, and very poor. The model estimated that approximately 2,800 acres in the Beasley Pond Analysis Area as being rated poor or very poor. With no action, groundcover conditions for these areas will continue to deteriorate due to overstory shading and woody encroachment. In studies such as Means (1997) light was determined to be the limiting factor in the reestablishment of wiregrass in slash pine plantations. Grassy, more herbaceous areas will become replaced with titi, gallberry, and other woody species. Areas identified as excellent and good by the model, and sensitive areas identified by FNAI, will see limited changes, unless a change in fire regime occurs. Savanna groundcover would remain relatively stable over the short term (1-5 years) however pine and hardwood encroachment will eventually begin to dominate the understory.

Mowing the right-of-way in the recurring road maintenance would likely result in the continued spread of invasive species such as climbing fern and cogongrass. Non-native invasive species treatment would continue to occur throughout the analysis area to combat the spread. Under the No Action alternative old growth stands would continue under current conditions, which currently do not meet the desired future condition. Encroachment of undesired plant and tree species would occur in small pockets and could potentially alter the growth type of the stand.

Cumulative Effects
Prescribed burning would continue every 3 to 4 years and would aid in keeping herbaceous groundcover dominant in areas identified by the ECM to be excellent, good, or fair. Fire can cause dramatic and immediate changes in vegetation, eliminating some species or causing others to appear where they were not present prior to burning. In the poor and very poor condition models prescribed burning alone would not restore herbaceous understory in these areas due to the continued overstory shading that would occur under Alternative A.

Non-native invasive species treatment would continue to control targeted species but only along travelways. Mechanical handtools and/or herbicides treatment would occur under the approved Isolated Wetlands EA. Woody vegetation would be removed within and around flatwoods salamander and striped newt breeding ponds to improve habitat. No significant cumulative effects to vegetation are expected under the No Action Alternative.

Alternative B – Proposed Action (Preferred Alternative)
The five ecological conditions in the Beasley Pond Analysis area: excellent, good, fair, poor, and very poor. Proposed treatments would occur in four classes under Alternative B.

- Good condition class – Timber harvest would promote continued growth and vigor of pine tree species and herbaceous groundcover growth. Uneven-aged management cuts are proposed in many areas designated under the good condition class. Tree harvest would promote multi-aged, self-sustaining stands described in the Forest Plan's desired future conditions for MA 7.1 and 7.2. Groundcover consists primarily of gramnoids that could be crushed during harvesting activities but not to an extent that would lead to these areas dropping to lower classifications. Savannas will be left with little to no impact following treatments to edges/transition zones and in adjacent stands.

- Fair condition class - Thinning would open the overstory of these stands and reduce the competition between residual trees for sunlight, moisture, and nutrients, leading to an increase in radial growth. Herbaceous vegetation would also respond favorably to an increase in sunlight, moisture, and nutrients (Means 1997). Prescribed burning windows for the fair condition class would become larger as the stands become more herbaceous and readily available to burn. Savanna vegetation rated as fair have patches of undesirable species present that could expand in the absence of fire or woody control treatments. Proposed treatments in conjunction with prescribed fire suppress woody species growth and move the savanna to the desired condition.

- Poor and Very Poor condition classes – Harvesting under the poor and very poor condition classes would provide the greatest benefit to both the overstory tree species and groundcover. Current conditions of these stands include overstocked stands with sparse groundcover due to the lack of sunlight penetration. Pine straw currently serves as the primary carrier of fire across these stands, resulting in a more narrow burn window. The harvest of trees in these stands would reduce the amount of pine straw needed in the short term however our fuels specialist and a biologist have determined that this pine straw reduction would not lead to a reduction in our ability to prescribe burn effectively. Thinning of pines stimulates herbaceous growth and abundance in longleaf stands (Harrington and Edwards 1999). Thinning would also reduce the chances of forest pest outbreaks associated with overstocked pine stands. Savanna vegetation in the poor condition class is mostly unrecognizable. The harvest of timber would be the initial steps towards restoring the areas to their historic conditions. As the abundance of herbaceous plant species increases the ability to burn in the poor and very poor condition classes will improve over the long term.

Harvesting operations, such as thinning pose a risk of direct mortality to sensitive plant species, but the benefit to the population as a whole would be positive. Vegetation in and around the proposed borrow pit would be removed for the foreseeable future. Species composition adjacent to the pit may change as soil characteristics such as nutrient availability and bulk density become altered during excavation.

In 2012 FNAI conducted field surveys on six compartments of the Apalachicola Ranger District, including the Beasley Pond Analysis Area, to identify locations of federally listed plant species, invasive exotic plant species, and sensitive areas of high quality natural communities. Occurrences of the rare plants Godfrey's butterwort and Florida skull cap were found in compartments 26 and 27. Six state listed plant species were also found throughout the analysis area and include: mock pennyroyal (compartment 25), narrow-leaved phoebanthus (compartment 25), Chapman's crownbeard (compartment 27), Apalachicola dragon-head (compartment 27), scare-weed (compartment 27), and greenfly orchid (compartment 27). Effects of alternative B on these species are further discussed on pages 62-92 and the Biological Assessment.

Wet savanna restoration treatments would remove a considerable portion of trees in and around the targeted area in anticipation of the return of the grassy open nature of historic wet savannas in the area. The use of heavy equipment may damage herbaceous vegetation, in particular in skid

trails and on logging decks. Impacts to wet savanna vegetation due to logging are not expected to be long term. Timber harvest in areas already containing large patches of woody plants such as gallberry could possibly lead to continued woody encroachment in the absence of fire. In areas with higher concentrations of woody groundcover (see figure 3), residual BAs will range between 30 and 40 square feet per acre. Leaving a higher BA in these areas will allow for needle cast to act as a carrier of fire across the stand until herbaceous plant species recover and take hold following harvest treatment. This will mostly be done on the edges or transition zones of the savannas sites and in sites that have been planted over. The interior of the stand, if groundcover conditions are more herbaceous will be thinned to an average of 10-20 BA. In the event of a substantial woody plant response following timber removal triclopyr would be used for spot treatment using backpack sprayers. If shrub response is minimal the use of herbicide will be limited or cancelled altogether.

Triclopyr is a growth regulator. It is readily absorbed by foliage with some stem uptake. It translocates up and down in plants, and accumulates in growing tissues and the root collar.

Non-target species kill could occur if application occurs before, during, or after adverse weather situations such as rain or high winds. When applying herbicides near rare plant species the following coordination measure will apply:

- **VG-37 -** Control invasive terrestrial and aquatic weeds. Do not apply herbicides within 60 feet of any PETS plant species unless analysis indicate herbicide use is the best way to protect PETS plants from invasive weeds (USDA 1999b). Contract specifications for equipment cleaning will be placed in contracts to prevent the introduction of exotic plants.

The excavation of a borrow pit in the analysis area would alter the vegetation composition within and around the proposed pit area. Vegetation within the pit would be removed completely and remain bare until the contents of the pit have been exhausted. Plant species more adapted to wetter, disturbed habitat will begin to inhabit the area around the pit.

Timber harvesting, road reconstruction, road maintenance, and mechanical/herbicide woody species control contracts would increase the risk of introducing non-native invasive plants into the project area. Mitigation measures would be included in all contracts that would require mechanical equipment be cleaned before entering the project area and when moving from one unit to another within the project area.

Cumulative Effects

Future impacts from prescribed burns in and around the analysis area in conjunction with the proposed action would positively affect vegetation such as wiregrass, which historically are maintained through natural fire process (Brockway and Outcalt 2000). In addition, a general reduction in risk of attack from forest pathogens and wildfire is expected to occur as timber thinning is implemented along with the normal prescribed fire program. Impacts are generally limited to within the project area. The proposed treatment in alternatives B would help move some treatment stands toward the desired future condition as described in the Forest Plan, however this will be a gradual change over time.

Climate change scenarios for the southeastern United States frequently include a moderate increase in average air temperature and a higher incidence and increased severity of droughts, fires, and hurricanes. These changes may have a variety of effects on ecosystems and processes, but planting longleaf pines and frequent prescribed fires should increase forest resistance to disease and catastrophic wildfire and increase resilience to extreme weather events (National Wild Turkey Federation 2009). In the context of climate change, the proposed activities will increase forest health and resilience to climate-related perturbation, whereas the no action alternative will produce forests that are less resistant and resilient to drought, disease, hurricanes, and insect damage.

Alternative C - Reduced direct impacts on threatened and endangered species
Potential impacts to federally listed plant species would be greatly reduced under Alternative C. Proposed activities under this alternative exclude stands 54 and 57 of compartment 27 and stand 19 of compartment 28. These stands were surveyed by FNAI and were found to have high occurrences of Florida skullcap. In other stands proposed for treatment, harvesting activities could injure or kill individual plants in skid trails and logging decks. Please refer to pages 69-71 regarding additional information on impacts to federally listed plant species. Wet savanna sites would be thinned to 40 BA which would leave more trees available for needle cast in the event of a woody shrub response following harvest. All other harvest impacts on vegetation are similar to those found in alternative B.

Cumulative Effects
Cumulative effects would be similar to those in Alternative B.

Alternative D – No Herbicide
In Alternative D, the environmental effects on vegetation would be the same for each action in alternatives B and C with the exception of herbicide application for woody species control. This alternative proposes woody control using handtools or mowers. The use of mechanical woody reduction would result in limited non-target plant species damage due to its more targeted nature. Re-sprouting of treated woody shrubs such as gallberry would occur shortly after initial treatment and would need multiple treatments in the event of a substantial woody shrub response following timber harvest.

Cumulative Effects
Cumulative effects would be similar to those in Alternatives B and C.

Unavoidable Adverse Effects

Under Alternative B, C, and D soil displacement and compaction are unavoidable results of timber harvest. Please refer to pages 43-48 for a more detailed description of soil impacts. Crushing, bending, and twisting of grasses, shrubs, and small trees will also occur under the three action alternatives. These effects are also unavoidable and discussed on pages 54-61of the EIS. Other unavoidable effects include:

- Change in forest structure as both small and large trees are removed during tree harvest operations.
- Temporary decrease in the aesthetic quality of the analysis area due to logging debris being visible throughout the stand.
- Temporary change in wildlife use patterns due to timber harvest and application of herbicide in Alternatives B and C.

Short-term Use and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Alternative A – No Action
Under alternative A there will be no short term use of forest products or any other values associated with the human environment of the analysis area. Long term productivity will not be affected by ongoing management activities such as prescribed burning, invasive species treatment, and isolated wetland improvement. More information on the effects of alternative A on the environment can be found on pages 43-61.

Alternative B – Proposed Action (Preferred Alternative)
Pine trees will be harvested from the analysis area and consumed for a variety of short term uses. Harvesting may negatively impact soil productivity during logging operations and shortly thereafter. These impacts over the long term are not expected to significantly affect soil productivity. The use of herbicides to control woody species encroachment would increase the long term productivity of the area. Herbicide application would be done to suppress/eliminate woody vegetation and promote an herbaceous stand that is readily available to prescribed burning. Burning releases nutrients into the soil that aid in the growth and establishment of herbaceous groundcover and overstory pine species (Certini 2005). Please refer to pages 43-48 for further analysis of the impacts of alternative B on soils.

Alternative C - Reduced direct impacts on threatened and endangered species
Short term uses and productivity impacts are similar to those found in alternative B. Overall loses in productivity will be less than alternative B due to fewer stands being treated. In addition heavy equipment use will be less impactful in proposed savanna restoration stands due to fewer passes to harvest fewer trees than in alternative B.

Alternative D – No Herbicide
The use of handtools for woody species control would not have an impact on long term productivity of the analysis area. All other impacts are similar to alternatives B and C.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Alternatives B, C, and D include the proposed excavation of a borrow pit to provide road material throughout the immediate area. The excavation would represent an irretrievable commitment of resources due to the removal of developed soils needed for vegetative growth. The differences in soil productivity within the pit and in the surrounding area will be distinct and unavoidable. Bulk density/penetration resistance and nutrient loss will impede the growth and establishment of plants for a significant amount of time (Brevik 2013). Recovery of productivity to levels of the surrounding area would depend on factors such as depth of excavation. Deeply excavated sites where subsoil is exposed tend to take longer to accumulate vegetation.

Biological Environment

Federal laws and US Forest Service policies require evaluating potential effects of the proposed action and alternatives on three groups of species: species listed or proposed for listing by the US Fish and Wildlife Service as threatened or endangered under the Endangered Species Act of 1973 (ESA), Management Indicator Species (MIS) identified in the Forest Plan, and species identified by the Regional Forester as sensitive. The level of analysis and terminology differ among these groups, and additional explanation is provided below. Detailed analysis is only provided once for species that are included in more than one group of relevant species.

Species listed as threatened or endangered under the Endangered Species Act

The Forest Plan provides the following guidance for management of federally listed species and analysis for how projects may affect them:

> The U.S. Fish and Wildlife Service (USFWS) is responsible for listing proposed, endangered, and threatened species. The Forest Service cooperates with that agency's efforts in conserving these species. The Forest Service conducts activities and programs to assist in the identification and recovery of threatened and endangered plant and animal species. Site-specific evaluations are conducted for any proposed activity that may take place within habitat for these species or near known populations. Measures are taken to avoid adverse effects (USDA 1999a, p. 3.17-3.18).

To comply with requirements for interagency consultation in Section 7 of the ESA, a biological assessment (BA) was prepared to determine the likely effects of the proposed action (Alternative B) on federally listed species. Detailed background and analysis for threatened and endangered species may be found in that document; no species proposed for listing occur in the project area. The analysis in the BA is summarized below along with the effects of all other alternatives.

Based on known occurrences of listed species, surveys of suitable habitat conducted in 2011-2013 and ongoing monitoring, the species included in the BA are the red-cockaded woodpecker (*Picoides borealis*), eastern indigo snake (*Drymarchon corais couperi*), frosted flatwoods salamander (*Ambystoma cingulatum*), Florida skullcap (*Scutellaria floridana*), Godfrey's butterwort (*Pinguicula ionantha*) and white birds-in-a-nest (*Macbridea alba*). The rationale for not analyzing other species that may occur or are known to occur on the Apalachicola National Forest is provided in the BA.

USFWS guidance for Section 7 consultation provides a framework for analysis and requires determinations for the effects of the proposed action on each species in the project area. The conceptual relationship between analysis and findings for PET species is as follows:

Table 8. The conceptual relationship between analysis and findings for PET species is as follows:

	Type of Effects Identified	Corresponding Determination of Effect
1.	No effects (not ever, any)	"No effect"
2.	Discountable, insignificant or completely beneficial effects	"May affect, Not likely to adversely affect"*
3.	Adverse effects	"May affect, Likely to adversely affect"*

This specific terminology is only applicable to the effects of the proposed action, and more general terms are appropriate for describing the effects of the other alternatives on threatened and endangered species.

Red-cockaded woodpecker

The Apalachicola National Forest contains the largest extant population of RCW and has continued to grow despite regular removal of fledglings for the species' translocation program. In 2003, when the revised RCW Recovery Plan (USFWS 2003) was finalized, the Apalachicola District was estimated to contain 486 active clusters. The current population estimate of 562 active clusters exceeds the contribution of 500 active clusters from the Apalachicola District to the Central Florida Panhandle Primary Population as stated in the Recovery Plan. The Beasley Pond project area contains 32 active clusters as of 2014. The project area also contains four inactive clusters that are not being managed as recruitment clusters. These four clusters have been inactive for 10+ years.

Alternative A – No Action

The No Action alternative would not directly change stand structure in the project area. Although clusters appear to be persisting and there are large areas of suitable habitat, some stands within the project area would become overly dense without active management through timber harvest. As such, foregoing management could have long-term negative effects on RCW by allowing stand conditions to further deviate from the habitat guidelines in the RCW Recovery Plan. Prescribed fire would maintain current habitat conditions in some stands that have herbaceous groundcover and improve others that don't have herbaceous groundcover. However, without the reduction of overstory vegetation it is not likely that good quality foraging habitat would increase in the project area.

Alternative B – Proposed Action (Preferred Alternative)
Analysis for this alternative can be found in the BA available on the project website http://goo.gl/GZ3NXm. Implementing the proposed timber thinning will improve RCW foraging habitat according to the criteria in the Recovery Plan. Of the 35 active clusters with foraging partitions in the project area, 24 would gain acres that meet the Managed Stability Standard (MSS) for foraging habitat and 13 would gain acres that meet the Recovery Standard for foraging habitat; no clusters would lose acres that meet either habitat criterion. The foraging partitions of 7 clusters contain at least 75 acres of suitable habitat within the ¼ mile partition and 17 meet this standard when contiguous habitat within the ½ mile partition is included. One cluster (28.06) would gain acres meeting MSS. However, the foraging partition would not reach the minimum 3000 ft^2 of pine basal area needed to meet MSS. Two savanna treatments (compartments 27 stands 52 and 55) change potential foraging habitat from above the MSS BA threshold of 80 to below the MSS BA threshold of 40. Because the opportunity to provide the minimum 3000 ft^2 of BA would be missed, indirect effects for this cluster would be negative. More information is available in the Biological Assessment. When considered in the context of ongoing prescribed fire, the proposed action will continue to improve groundcover vegetation and maintain open stands favored by RCW. However, if seasonal hauling guidelines from the RCW Recovery Plan are relaxed as proposed (to allow heavy equipment access to wetter areas), timber harvest and associated activities may disrupt several RCW clusters during the breeding season. Therefore, implementing the proposed action is likely to adversely affect red-cockaded woodpeckers because individuals may be disturbed during nesting season.

Alternative C - Reduced direct impacts on threatened and endangered species
This alternative was developed specifically to avoid potential negative effects of project activities on RCW. This alternative would be beneficial for the RCW because no stand treatments would reduce basal area below 40 ft^2/acre, the minimum required to meet the MSS from the RCW Recovery Plan, and all breeding season restrictions on timber harvest activities would be followed. Foraging habitat meeting the MSS and the recovery standard would increase in the future as a result of implementing this alternative compared to Alternative B. By limiting harvest schedules based on seasonal restrictions it is possible that there would be delays in thinning stands, which would result in delays to reintroducing prescribed fire to the project area. This could result in short-term habitat degradation due to growth of woody shrubs that are usually limited by prescribed fire. None of the stands currently proposed for savanna restoration (including reducing tree density to below 40 ft^2/acre) currently meet the criteria for foraging habitat in the Recovery Plan, but under this alternative it is possible that these stands could meet the criteria in the future. By aligning this alternative strictly with guidelines in the RCW recovery plan, implementation should avoid any adverse effects to red-cockaded woodpeckers. This alternative when combined with past, present, and future management activities is expected to benefit RCWs. The proposed thinning treatments would open up the canopy stimulating groundcover. Prescribed burning would initially improve and then maintain these more open conditions favored by the RCW.

Alternative D – No Herbicide
Direct and indirect effects under this alternative are expected to be similar to the proposed action except there would be no effects from herbicide. Risks to RCW from herbicide exposure are minimal (as described in the Biological Assessment), but this alternative may not have as great

an impact on reducing the woody vegetation without the use of herbicide. Mechanical midstory removal would reduce woody vegetation initially, but woody vegetation is likely to re-sprout from the roots. Without a rigorous prescribed fire regime directly following mechanical treatment it is not likely that mechanical treatments would be as effective as herbicide at improving midstory and groundcover conditions. The overall effects of this alternative would still be positive and simlar to those for alternative B, but there is some risk that woody shrubs would not be well controlled without herbicide or that control would require multiple expensive mechanical treatments.

This alternative when combined with prescribed burning is likely to have beneficial cumulative effects to RCW Habitat. The proposed thinning treatments and woody vegetation removal would open up the canopy stimulating groundcover. Prescribed burning would initially improve and then maintain these more open conditions favored by the RCW. However due to the absence of herbicide use, these treatments are not expected to be as effective. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation. Habitat would be improved as a result of implementing this alternative. However, like alternative B, harvest hauling restrictions would need to be waived in some clusters in order to remove timber. Clusters affected by these actions would be the same clusters as those in alternative B. Therefore, implementing alternative D is likely to have short-term (i.e., one or two years) negative effects on red-cockaded woodpeckers due to disturbance during the breeding season.

Eastern indigo snake

Historical range extended throughout the lower Coastal Plain of the southeastern United States, from southern South Carolina through Georgia to the Florida Keys, and west to southern Alabama and perhaps southeastern Mississippi. Current range includes southern Georgia and Florida (widely distributed througout the state, south to the Keys, though perhaps very localized in the panhandle). The species is apparently very rare or extirpated in Alabama, Mississippi, and South Carolina. Recent reintroductions have been made in Florida, Alabama, Georgia, South Carolina, and Mississippi. Habitat includes sandhill regions dominated by mature longleaf pines, turkey oaks, and wiregrass; flatwoods; most types of hammocks; coastal scrub; dry glades; palmetto flats; prairie; brushy riparian and canal corridors; and wet field. Occupied sites are often near wetlands and frequently are in association with gopher tortoise burrows (NatureServe2013). In the northern part of its range, including the Florida panhandle where this project is located, the indigo snake is highly dependent on gopher tortoise burrows as a refuge from cold winter temperatures (Moler 1992). Although suitable habitat exists in the Beasley Pond Analysis Area, the eastern indigo snake is rare or absent on the ANF with the last confirmed sighting in the sandhill areas southwest of Tallahassee, FL in 1996 (Enge et al. 2013).

If any actions are approved in the Beasley Pond Analysis Area, coordination measures for implementation would include following the US Fish and Wildlife Service’s eastern indigo snake protection measures as well as state guidelines for avoiding harm to gopher tortoises or their burrows.

Alternative A – No Action
This alternative would have no direct effects on eastern indigo snakes because no actions would take place. There is some potential gopher tortoise habitat within the analysis area but recent habitat mapping and surveys (unpublished, work conducted by FNAI in 2014) suggest that the project area does not include large areas of high-quality habitat. Taking no action would keep the analysis area in its current state and would not improve habitat conditions for indigo snakes. Because taking no action would have negligible effects on indigo snakes or their habitat, there are no cumulative effects of this alternative in the context of ongoing processes and previously approved activities. Prescribed fire would continue to maintain stands that currently have herbaceous groundcover but it is unlikely that stands with a high abundance of canopy cover would be improved with prescribed fire alone.

Alternative B – Proposed Action (Preferred Alternative)
Analysis for this alternative can be found in the Biological Assessment available on the project website. In summary, because indigo snakes are not known from the area and because high-quality habitat is limited, it is unlikely that implementing the proposed action would directly affect this species. Timber harvest activities could disturb or harm indigo snakes, as described in the Forest Plan Biological Assessment and US Fish and Wildlife Service Biological Opinion (USDA 1999b,). However, given the lack of known occurrences, the scarcity of high-quality habitat and the relatively low density of gopher tortoises, the proposed action is not likely to adversely affect the eastern indigo snake. When combined with ongoing prescribed burning, this alternative would improve habitat for both gopher tortoises and indigo snakes, which could increase the likelihood that indigo snakes could persist in the area in the future.

Alternative C and D
Direct, indirect, and cumulative effects to eastern indigo snakes would be similar to alternative B except implementing alternative C would treat fewer acres and alternative D may not have as great an impact on reducing the woody vegetation without the use of herbicide. These alternatives, when combined with prescribed burning, are likely to have few cumulative effects on eastern indigo snake because it is unlikely that the species occurs in the project area, however, both alternatives C and D would result in improved habitat conditions in the future as beneficial cumulative effects and improve eastern indigo snake habitat in the project area.

Frosted flatwoods salamander

This species' range includes the lower southeastern Coastal Plain of the United States from southern South Carolina southward to Marion County (north-central Florida) and disjunctly westward through southern Georgia and northern Florida to the Apalachicola and Flint rivers (mid-Panhandle of Florida and northward) (NatureServe 2013). Habitat consists of pine flatwoods communities with wiregrass groundcover and scattered wetlands often dominated by cypress and gum. Frosted flatwoods salamanders usually breed in ephemeral ponds that lack predatory fish and have emergent vegetation. (Hipes et al 2001). Potential threats include conversion of pine flatwoods habitat for agriculture, silviculture, or commercial/residential development; drainage or enlargement (with subsequent introduction of predatory fishes) of breeding ponds; habitat alteration resulting from suppression of fire; mortality and collecting

losses associated with crayfish harvest; and highway mortality during migration (NatureServe 2013).

There are four ponds within the project area where flatwoods salamanders have been documented, as well as associated USFWS designated Critical Habitat (USFWS 2009). Flatwoods salamanders were originally observed at these sites in the mid 1990s. Observed use by flatwoods salamanders has not occurred in compartment 27 since that time, while larval salamanders in the compartment 28 ponds have been observed as recently as 2011. There are also 29 potential flatwoods salamander breeding ponds in the project area, which are assumed to be unused based on surveys completed by forest biologists. Locations of the documented ponds and critical habitat can be seen in the Biological Assessment.

Alternative A – No Action
There would be no direct effects under this alternative because no new actions would be authorized that would affect flatwoods salamanders or their critical habitat. It is likely that under the no action alternative isolated wetlands and surrounding uplands would remain in their current condition or slightly decline over time due to continued shading and altered hydroperiod as a result of high evapotranspiration from dense trees and shrubs. However, because the alternative would have no direct and uncertain indirect effects, there would be no cumulative effects under this alternative.

Alternative B – Proposed Action (Preferred Alternative)
Analysis for this alternative can be found in the Biological Assessment available on the project website. In summary, implementation of the proposed action would follow Forest Plan standards to avoid harm to frosted flatwoods salamanders during breeding season and avoid degrading habitat within and adjacent to breeding ponds. By altering the timing of heavy equipment use and managing buffer zones around known breeding ponds, the proposed action should have no negative direct effects on flatwoods salamanders or designated critical habitat. Because the proposed timber harvest will promote upland habitat conditions favorable for flatwoods salamanders, indirect effects of this alternative should be positive. Upland habitat in the project area would continue to be managed with prescribed fire and known or potential breeding ponds would be affected by both prescribed fire and mechanical removal of woody vegetation authorized in a recent decision (i.e., 2013 Isolated Wetlands Restoration project). In the context of these activities, the proposed action is expected to have beneficial cumulative effects on flatwoods salamander habitat by facilitating prescribed fire that will maintain and improve upland conditions and move through the isolated wetlands that may be used for breeding. Based on these effects and the coordination measures to avoid harming individuals, the proposed action is not likely to adversely affect frosted flatwoods salamander or designated critical habitat.

Alternative C - Reduced direct impacts on threatened and endangered species
Alternative C was designed to avoid potential adverse effects to red-cockaded woodpeckers by following seasonal guidelines for timber harvest near clusters and by not thinning historical savanna stands in the project area to below 40 ft^2/acre of basal area. Implementing this alternative would not include restoring historical savannas that are within designated critical habitat (Compartment 27, stands 37, 52 and 55) and are adjacent to the two known flatwoods salamander breeding ponds in Compartment 27. High-quality seasonal wetlands in which

flatwoods salamanders breed often occur in wet savanna habitats and this alternative would not include restoration activities to the very low pine density that historically characterized. Therefore, although this alternative would not have direct effects on flatwoods salamander, it would represent a missed opportunity for habitat restoration activities included in the proposed action. Otherwise, the effects of alternative C would be similar to those for alternative B as described in the Biological Assessment.

Alternative D – No Herbicide
This alternative would have effects similar to alternative B except there would be no potential effects from herbicide. Woody vegetation reduction would be accomplished mechanically, initially reducing the hardwood vegetation in the treated stands. This, however, is expected to only have short term beneficial effects as mechanical removal only top kills most woody vegetation and they would likely resprout soon after cutting. Thinning and mechanical woody vegetation removal when combined with prescribed burning would have beneficial cumulative effects for frosted flatwoods salamanders. Aggressive prescribed burning would need to be coordinated with the mechanical treatments in order to be affective. This may not be feasible due to strict prescribed burning parameters and repeated mechanical treatments and prescribed burning may be needed.

Godfrey's butterwort, Florida skullcap and white birds-in-a-nest

Because these three species occur in similar habitats, respond similarly to disturbances, and share a Recovery Plan (USFWS 1994), the effects of the alternatives will be discussed together.

Godfrey's butterwort occurs in Bay, Calhoun, Franklin, Gulf, and Liberty counties in Northwest Florida (NatureServe 2013). This species is found in seepage slopes, bogs, roadside ditches, depressions, and transition zones between wet pine flatwoods and wet prairies (Chafin et al 2000). Protection and management suggestions include prescribed burning on a two to three year rotation, avoiding herbicides along roadsides, avoiding rutting and compacting wetland soils, and avoiding the placement of firebreaks in wetland ecotones. The analysis area was surveyed in the growing seasons of 2012 and 2013 by Florida Natural Areas Inventory (FNAI) and several previously undocumented occurrences were discovered. Prior to these surveys no Godfrey's butterwort populations were known to exist in the project area. The majority of the populations, found in compartments 26, 27, and 28, are located in the ecotonal habitat between the flatwoods and the wetland edges, outside of the treatment stand boundaries (FNAI, 2013).

Florida skullcap is known from the Apalachicola region of the Florida panhandle from Liberty, Franklin and Gulf counties. It can be found in wet pine flatwoods, grassy margins of cypress stringer, seepage slopes, and transition zones between flatwoods and wetlands (Chapin et al 2000). The analysis area was surveyed in the growing seasons of 2012 and 2013 by FNAI. Prior to these surveys no Florida skullcap populations were known to exist in the project area. Populations were found in compartments 26, 27, and 28. In 2012, two populations were found in compartment 28 after a recent prescribed burn. In Compartment 27, surveys were conducted during this species' flowering period two months after the compartment was burned in February 2013. Almost 2000 flowering individuals were found at 4 locations within an approximately 2 square km area in the center of compartment 27. Plants were found not only in open wet prairie

habitat but also in light shade under shrubs and scattered pines near the boundary between flatwoods or plantations and more open habitats (FNAI, 2013).

White birds-in-a-nest is endemic to the Florida Panhandle and can be found in wet to mesic flatwoods and associated roadsides or open areas. Protection and management suggestions include prescribed burning every 2 to 3 years, and avoiding conversion of flatwoods to pine plantations because mechanical site preparation and canopy closure kills this species (Chapin et al 2000). Historic records indicated that this species was once present in the analysis area. FNAI conducted surveys in 2012 and 2013 at the historic locations along with the rest of the analysis area and did not encounter any individuals.

Alternative A – No Action
No direct effects would occur under this alternative because no actions would take place that could damage individuals. Indirect effects of not approving timber thinning would include persistence of suboptimal habitat over large parts of the project area. Shading from slash pine plantations or overly dense natural pine stands would increase as trees mature, likely degrading habitat for all three species. Recent surveys demonstrate that regular prescribed fire is important for stimulating flowering of Florida skullcap, so even without harvesting timber it is possible to maintain habitat and protect populations of these species in the project area through already authorized prescribed fire. In the context of prescribed fire management, the cumulative effects of not authorizing additional timber harvest and restoration activities in the project area are minimal.

Alternative B – Proposed Action (Preferred Alternative)
Analysis for this alternative can be found in the Biological Assessment available on the project website. In summary, it is possible that implementation of the proposed timber harvest could damage individuals directly or through soil disturbance. It is also possible that herbicide application could harm individuals, though recent surveys will allow known locations to be avoided. Because Godfrey's butterwort does not occur within treatment stands (or occurs in open areas in treatment stands that would not be disturbed) and because recent surveys did not find white birds-in-a-nest in suitable habitat or previously reported locations, implementation of the proposed action may affect, but is not likely to adversely affect these two species. The proposed action may affect and is likely to adversely affect Florida skullcap in the short term because it would be impossible to avoid all populations during timber harvest due to the abundance of this species in the analysis area. Some individuals would be lost but indirect and cumulative effects are expected to be beneficial because habitat conditions would improve as a result of project implementation.

Alternative C - Reduced direct impacts on threatened and endangered species
In this alternative direct and indirect effects for Godfrey's butterwort would be similar to those in alternative B. Stands containing large populations of Florida skullcap identified as historical wet savanna would not receive any treatments to avoid potential direct impacts to individual plants. While this would avoid potential negative direct impacts to individuals in the short term, this alternative would not improve conditions for this species in the long term. In the non-treatment stands trees would continue to grow further shading Florida skullcap and decreasing habitat

quality for this species. Potential effects on white birds-in-a-nest would be similar to those described for the proposed action above.

Cumulative effects for Godfrey's butterwort and white birds-in-a-nest would be similar to those in alternative B. This alternative when combined with prescribed burning would be slightly beneficial for Florida skullcap. Habitat would be improved for individuals present on the edges of treatment stands because the canopy would be opened up and prescribed burning would improve groundcover conditions. However individuals located in non-treatment stands would only have prescribed burning to maintain habitat. The canopy would continue to close, shading out this light dependent species.

Alternative D – No Herbicide

The only difference between alternative B and alternative D would be that herbicide would not be used. The immediate impacts would be similar, but this alternative would not include the slight risk of negatively impacting federally listed plant species with herbicide. However, the long-term shrub reduction and habitat improvement would likely be more effective with the use of herbicides. Cumulative effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve sensitive plant habitat. Opening up the pine canopy and improving herbaceous groundcover would improve conditions for these species. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

Cumulative effects for Godfrey's butterwort and white birds-in-a-nest would be similar to those in alternative B. This alternative when combined with prescribed burning would be beneficial for Florida skullcap. Habitat would be improved for individuals present on the edges of treatment stands because the canopy would be opened up and prescribed burning would improve groundcover conditions. However individuals located in stands with woody shrub encroachment may be negatively affected by multiple efforts to mechanically reduce shrubs. However, even if this additional work was needed in lieu of herbicide application, some individuals would be lost but indirect and cumulative effects are expected to be beneficial because habitat conditions would improve as a result of project implementation.

Table 9. Summary of the TES species effects determinations for the Beasley Pond Project January 2015.

SPECIES	ALT A	ALT B	ALT C	ALT D
*Red-cockaded Woodpecker	No Effect	May Effect, Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Likely to adversely affect
*Harperocallis flava	No Effect	No Effect	No Effect	No Effect
*Macbridea alba	No Effect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect
*Scutellaria floridana	No Effect	May Effect, Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Likely to adversely affect

SPECIES	ALT A	ALT B	ALT C	ALT D
*Pinguicula ionantha	No Effect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect
*Indigo snake	No Effect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect
*Flatwoods salamander	No Effect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect	May Effect, Not Likely to adversely affect

Management Indicator Species

Under the National Forest Management Act of 1976 (NFMA), the Forest Service is charged with managing National Forests to provide for a diversity of plant and animal communities consistent with providing for multiple uses of forest resources. Monitoring population or habitat trends of Management Indicator Species is one tool used to accomplish this objective. MIS are selected "because their population changes are believed to indicate the effects of management activities" (1982 planning regulations formerly at 36 CFR 219(a)(1)). Trends in MIS or their habitat are primarily documented at the level of the entire forest at intervals of a year or more. At the level of specific projects, such as the Beasley Pond Analysis Area, the analysis should identify which MIS are known from the area or have suitable habitat in the area and then disclose the likely effects of the proposed action and alternatives on those species.

In 2011 the National Forests in Florida revised the list of MIS species through a Forest Plan amendment (Amendment 10). Species or suites of species were identified for each of the major managed habitat types; unmanaged habitats do not require MIS because they are not directly affected by most activities authorized in the Forest Plan. The plant and animal species that occur in the Beasley Pond Analysis Area are typical of the southern Coastal Plain, although several rare and habitat-restricted species also occur in the project area. The current stand descriptions and historical natural communities map show that the major habitats in the project area are flatwoods (mostly mesic), freshwater forested swamps, wet prairie/savanna, upland pine (primarily in Compartment 25) and small areas of sandhill (Figure 4). No MIS were identified in the Forest Plan for freshwater forested swamps; MIS for the other major habitat types are in Table 10 below.

Table 10. MIS species for major managed habitats in the Beasley Pond Analysis Area

Habitat	Species or groups
Bog, Seepage Slope, Depression Marsh, and Wet Prairie/Savannahs	• perennial fire-dependent graminoids (positive indicator, includes wiregrass, pineywoods dropseed, Chapman's beaksedge, toothache grass, hairy muhly grass, Florida toothache grass) • woody shrubs/trees (negative indicator) • titi (negative indicator)
Sandhill, Scrubby Flatwoods, Xeric Hammock, Upland	• red-cockaded woodpecker (positive indicator)

Hardwood Forest, and Slope Forest	• Bachman's sparrow (positive indicator) • perennial fire-dependent graminoids (positive indicator, includes wiregrass, pineywoods dropseed, Chapman's beaksedge, toothache grass, hairy muhly, Florida toothache grass) • saw palmetto (negative indicator For sandhills only: • onsite trees (positive indicator in low numbers: turkey oak, sand post oak, sand live oak, bluejack oak) • offsite trees (negative indicator as abundance increases: laurel oak, sand pine)
Mesic Flatwoods and Wet Flatwoods	• red-cockaded woodpecker (positive indicator) • Bachman's sparrow (positive indicator) • saw palmetto (negative indicator) • titi (negative indicator) • woody shrubs/trees (negative indicator) • perennial fire-dependent graminoids (positive indicator, includes wiregrass, pineywoods dropseed, Chapman's beaksedge, toothache grass, hairy muhly, Florida toothache grass)

Since the analysis area occurs in sandhill, flatwoods, and wet savanna habitats all MIS plant groups will be addressed.

Red-Cockaded Woodpecker

The red-cockaded woodpecker (RCW) was identified as an MIS for sandhill and flatwoods habitats and is also listed as endangered under the Endangered Species Act of 1973. Detailed analysis of the effects of the proposed actions on RCWs is presented in the Biological Assessment (available on the project website) and the effects of all alternatives are presented in the analysis for federally listed species above.

Bachman's Sparrow

Bachman's sparrows are found in the southeastern United States. Most of the populations live in Florida and along the Gulf Coast. They are also found as far North as the Indiana-Michigan border and as far west as the Arkansas-Oklahoma border. In the winter, Bachman's sparrows are especially secretive thus making their habits during this time hard to know. Their winter range seems to be limited to the coastal southeastern U.S. This species is mostly found in open oak and pine forests with abundant grasses. They are most often found in forests with wiregrass (*Aristida*) or broomsedge (*Andropogon*). Populations are highest in areas where forest fires are regular, eliminating hardwood understory shrubs. Bachman's sparrow populations disappear 4 to 5 years after a burn. Much of their original habitat, open pine forests, has been logged throughout their range, forcing the species into marginal habitats such as forest edges and utility rights-of-way. In the marginal habitats, hardwood understory shrubs are discouraged by poor soils, fires, or human management (Dewey and Darin 2007).

Bachman's sparrow was selected as an MIS because they prefer habitat similar to that described in the desired conditions for flatwoods and sandhills on the Apalachicola National Forest, and their presence and abundance indicates the effects of management in these habitats. In general, management actions that reduce hardwood midstory, promote open stand structure and encourage growth of grassy and herbaceous vegetation benefit this species. Bachman's sparrows are included in annual bird point counts and the number of individuals counted on the Apalachicola National Forest has been variable but shows little evidence of multi-year trends (see FY 2011 Forest Plan monitoring report).

Alternative A - No Action

Under the No Action alternative, Bachman's sparrow trends in this area would be expected to show no change or slightly decline in the project area. Much of the potential Bachman's sparrow habitat in the project area currently has a dense pine overstory. A closed pine canopy causes a decrease in herbaceous groundcover due to competition for sunlight and nutrients. Although many of these stands currently have herbaceous groundcover, as trees continue to mature and the canopy continues to close further, groundcover conditions are expected to decline. Under this alternative habitat conditions would decline in dense pine stands.

Cumulative Effects

The continuation of prescribed burning alone would likely not improve habitat enough in the project area to result in any noticeable increase of sparrow numbers. Prescribed burning would maintain herbaceous ground cover in the short term, but as trees mature and the canopy become denser herbaceous groundcover is expected to decrease due to shading. Although prescribed burning is a necessary component of Bachman's sparrow management, application of routine prescribed burning alone may not be enough to improve or sustain Bachman's sparrow habitat in the long term.

Alternative B – Proposed Action (Preferred Alternative)

This action alternative would contribute to improving habitat for the Bachman's sparrow. Thinning pine stands, savanna treatments, and herbicide applications would control woody vegetation, thin the pine overstory, and increase herbaceous vegetation needed for quality Bachman's sparrow habitat. Herbicide application is not likely to directly affect this species because herbicide would be applied directly to target vegetation, reducing the possibility of forage contamination (grass seeds and insects). This species is a ground nester, and it is not likely to be present in herbicide application areas because these areas would not provide suitable nesting habitat. Bachman's sparrows prefer open, well-burned pine stands. It is unlikely that implementing the proposed action would result in a substantial change in overall population, but numbers may increase in the project area in response to improved habitat conditions. The Beasley project includes timber harvest activities that are commonly used in RCW habitat on the Apalachicola National Forest. Potential effects of the activities proposed in the Beasley project include disturbance of RCW from timber harvest operations and alteration of foraging habitat.

Cumulative Effects

The effects of this project, other ongoing projects, and future projects that restore the open pine system would positively influence Bachman's sparrow numbers over time. Project activities would decrease canopy cover and stimulate groundcover. Prescribed burning would then

maintain openness and herbaceous groundcover favored by Bachman's sparrow. An increase in Bachman's sparrows in the analysis area would be expected as the desired future condition for the entire forest is attained.

Alternative C - Reduced direct impacts on threatened and endangered species
This alternative would have similar effects as alternative B except not as many acres would be treated and stands would not be thinned to basal area below 40 ft^2/acre. This alternative would still improve Bachman's sparrow habitat. However since treatment acreage is reduced in this alternative, it would not improve as many habitat acres as alternative B.

Cumulative Effects
The effects of this project, other ongoing projects, and future projects that restore the open pine system would positively influence Bachman's sparrow numbers over time. Project activities would decrease canopy cover and stimulate groundcover. Prescribed burning would then maintain openness and herbaceous groundcover favored by Bachman's sparrow. An increase in Bachman's sparrows in the analysis area would be expected as the desired future condition is attained.

Alternative D – No Herbicide
This action alternative could have a positive effect on Bachman's sparrow habitat by ensuring an open pine canopy in a shorter time period then burning alone. However mechanical treatment frequently only top kills vegetation and repeated treatments may be needed to kill the undesirable vegetation.

Cumulative Effects
This alternative when combined with prescribed burning would have beneficial cumulative effects for Bachman's sparrow. This alternative would open up the canopy with mechanical vegetation removal and tree thinning, and prescribed burning would stimulate the herbaceous groundcover needed for nesting and foraging. However, mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation. Also these treatments would need to be coordinated with prescribed fire to be effective which may not be feasible due to weather patterns.

Perennial fire-dependent graminoids

This suite of species includes wiregrass, pineywoods dropseed, Chapman's beaksedge, toothache grass, hairy muhly and Florida toothache grass. The density of these species indicates management effectiveness in flatwoods, sandhills and savannas. Increasing trends of perennial fire-dependent graminoids are aligned with achieving the desired conditions for these habitat times. These species are favored by thinning dense pine stands and frequent prescribed fire; they were selected as MIS because they are related to Forest Plan objectives and respond to management.

Alternative A – No Action
Under alternative A, this plant group would only be affected by natural processes and previously approved management actions such as prescribed fire and treatment of non-native invasive plant species. Although ongoing prescribed burning does benefit these species, it is not likely that prescribed burning alone, with continuation of the recent timing and intensity of prescribed fires,can significantly increase graminoid density in unthinned plantations in the project area. These species are light dependent and they are probably limited by competition in many of the dense pine stands in the project area. As the trees continue to mature and the canopy continues to close, fire-dependent graminoids are expected to decrease in density due to restricted sunlight and nutrients if no additional management actions are authorized in the project area.

Alternative B – Proposed Action (Preferred Alternative)
Fire dependent gramnoid species evolved in the longleaf pine-wiregrass community and require an open, fire-maintained landscape. The species under consideration are shade-intolerant and would benefit from the thinning of dense pine trees included in the proposed action. It is anticipated that the woody vegetation treatments (herbicide application) would improve conditions for these plant species by reducing the shrubs and, when combined with prescribed burning, would result in increased graminoid abundance. This alternative when combined with past, present, and future activities is expected to cumulatively improve habitat conditions for these species.

Individuals may be crushed, broken, uprooted, buried or otherwise harmed during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. Impacts to individuals from herbicide application could include direct or indirect deposition from unintentional spraying, spray drift, or contaminated water/soil movement. If sprayed accidentally, even at the low application rates used by the Forest Service, non-target vegetation could be damaged. Selective application methods would be employed and would minimize potential adverse effects. Even with some disturbance to existing desirable groundcover, long-term positive benefits would be expected from implementation of this alternative.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to fire dependent graminoids would be similar to alternative B except fewer acres would be treated and habitat conditions in the stands proposed for savanna restoration would not be improved by thinning dense pine trees.

Alternative D – No Herbicide
As in Alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. Use of prescribed fire alone, with the existing vegetative conditions, may not be as effective at reducing the woody vegetation competition as in Alternative B. The risk on damage to non-target plant species with this alternative may be slightly smaller because herbicide application is not included. However, mechanical treatments primarily top kill target vegetation and multiple mechanical treatments may be needed to reduce titi and other woody vegetation abundance in the analysis area. When combined with past, present, and future management activities, there would likely be cumulatively long-term habitat improvement for these herbaceous plants, but activities may be

less effective without the use of herbicides.

Saw palmetto

On the Apalachicola National Forest, saw palmetto is primarily found in flatwoods habitats and is often associated with longleaf pine. Saw palmetto is a native species and provides many benefits to wildlife, but dense palmetto understories can indicate that prescribed fire is not effective at managing for wiregrass and other grassy and herbaceous species in these habitats.

Alternative A – No Action
Under this alternative palmetto abundance is expected to stay the same. Prescribed fire would maintain palmetto abundance keeping this species from becoming over-abundant in the analysis area. No cumulative effects are expected because no actions would take place.

Alternative B – Proposed Action (Preferred Alternative)
While saw palmetto is native to sandhill and flatwood habitats, an overabundance of this species can decrease diversity and shade out herbaceous groundcover. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation removal and herbicide treatments. Palmetto would be reduced in high traffic areas and herbicide treatment sites, but palmetto in lower traffic areas is not expected to perish. This alternative when combined with past, present, and future activities is expected to cumulatively reduce palmetto in the analysis area. Palmetto would decrease through damage by timber operations and herbicide in conjunction with ongoing prescribed burning.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to saw palmetto would be similar to alternative B except fewer acres would be treated.

Alternative D (No Herbicide)
Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging and mechanical vegetation removal. Palmetto would be reduced in high traffic areas, but palmetto in lower traffic areas is not expected to perish. These activities when combined with past, present and future management activities such as prescribed fire would cumulatively help achieve desired management goals for the project area. However there is expected to be less palmetto reduction without the use of herbicides.

Titi

Titi (both *Cyrilla racemiflora* and *Cliftonia monophylla*) are woody shrubs native to the Apalachicola National Forest. When fire is suppressed or occurs at low frequency or intensity, titi expands from shrubby or forested wetlands into flatwoods and wet savannas. The Forest Plan recognized the need to manage titi in these habitats stating that “in areas where titi has encroached, run hot fires into the titi or chop and burn the area. Seek to minimize soil disturbance when chopping” (USDA 1999a, p. 3-18). Low density and height of titi in flatwoods and wet savannas is aligned with desired conditions for these habitats and is most efficiently

maintained by frequent prescribed fire.

Alternative A – No Action
Titi abundance in the analysis area is expected to show no change or slightly increase under this alternative. No new actions would be authorized under this alternative, leaving prescribed burning as the only current action to control titi. Prescribed burning would maintain current conditions in some areas while decreasing titi abundance in others depending on fire intensity. No past, present, or future activities are expected to be cumulative with this alternative.

Alternative B – Proposed Action (Preferred Alternative)
Implementation of the proposed action should reduce titi in some areas by facilitating management with prescribed fire. Creation of more open canopy conditions from timber harvest is expected to promote grassy and herbaceous vegetation, which would allow fire to carry farther, pushing the titi back towards the wetland edges. However, if the stands are not burned after harvest it is possible that titi could also benefit from the increased light available. To minimize this possibility, the proposed action includes measures to complete timber harvest quickly to allow continued management with prescribed fire in the project area. Therefore, in the context of ongoing and future objectives for prescribed fire, this alternative is expected to cumulatively reduce titi in the analysis area.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to titi would be similar to alternative B except fewer acres would be treated.

Alternative D – No Herbicide
Under this alternative titi abundance is expected to slightly decrease. The effects should be similar to those described for Alternative B, but since mechanical vegetation removal primarily only top kills vegetation multiple treatments may be needed to reduce titi in the long term.

Woody shrubs/ trees

The desired conditions for flatwoods include grassy and herbaceous understories with limited abundance of woody shrubs or trees such as: gallberry, large gallberry, fetterbush, sweet pepper bush, sweetgum, loblolly bay, water oak. These species are native, but are primarily found in flatwoods when the frequency, seasonality and/or intensity of fire is insufficient. Therefore, the overall density of these species is a good indicator of management effectiveness.

Alternative A – No Action
Under this alternative, woody shrubs and trees are expected to slightly increase or maintain current levels of abundance. While these are native to the ecosystem and do provide forage for some wildlife species, high density of these species can reduce herbaceous ground cover needed to support the crucial fire regime that maintains quality flatwood and sandhill habitat. Prescribed fire does reduce the abundance of these species, but once these species become over abundant prescribed fire does not burn effectively due to the lack of fine fuels. No past, present, or future activities are expected to be cumulative with this alternative.

Alternative B - Proposed Action
Alternative B is expected to reduce woody trees and shrubs in the project area. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. These actions would reduce overabundance of these species allowing more herbaceous groundcover to establish and carry fire more effectively through the project area. These activities when combined with past, present and future management activities such as prescribed fire would cumulatively help achieve desired management goals for the project area.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to woody shrubs and trees would be similar to alternative B except fewer acres would be treated.

Alternative D – No Herbicide
As in alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. Use of mechanical and prescribed fire alone, with the existing vegetative conditions, may not be as effective at reducing the woody vegetation competition and multiple mechanical treatments may be needed because these treatments primarily only top kill vegetation. These activities when combined with past, present and future management activities such as prescribed fire would cumulatively help achieve desired management goals for the project area, but would not be as effective with the absence of herbicide application.

Sandhill onsite and offsite trees

There are few sandhill sites in the Beasley Pond Analysis Area and the areas in Compartment 28 identified as sandhill on the historical natural communities map are not proposed for vegetation management. However, it is possible that management of adjacent stands could indirectly affect sandhill sites. Additionally, the upland pine stands in Compartment 25 share many characteristics with sandhill, including fire-adapted oak and other hardwood species.

These two suites of species were added to the MIS by Forest Plan Amendment 10. Sandhill onsite trees (turkey oak, sand post oak, sand live oak, bluejack oak) are fire-adapted species that are desirable components of sandhill habitats. These species provide quality forage for wildlife, fuels for prescribed fire and important microhabitats, but overabundance due to insufficient fire frequency or intensity indicates degrading habitat conditions.

Laurel oak and sand pines were identified as offsite species for sandhill habitats. In general, these species do not persist with regular fire and high abundance indicates need for management. After longer periods of fire suppression, mechanical removal or herbicide may be the most effective way to reduce offsite trees, and after initial removal the sites ccan then be managed with more regular prescribed fire. An overabundance of these species indicates degrading habitat conditions.

Alternative A – No Action
If no new activities are authorized, composition of sandhill and upland pine stands in the project

area will be influenced by ongoing processes such as competition among plants and previously approved prescribed fire. With sufficiently frequent prescribed fire, stands that include a small component of fire-adapted oaks will be maintained in their current condition. However, stands that contain an overly dense oak midstory including species not adapted to frequent fire are less likely to burn and will likely become even more dominated by oaks and other hardwoods (Hiers and others 2014).

Alternative B - Proposed Action (Preferred Alternative)
Alternative B is expected to reduce the abundance of oaks in upland pine stands in Compartments 25 and a small number of stands in Compartment 26. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging and mechanical vegetation removal. These actions would reduce the density of these species allowing more herbaceous groundcover to establish and carry fire more effectively through the project area. Timber harvest in Compartment 28 will improve groundcover in several flatwoods stands adjacent to stands mapped as historical sandhill. This should produce more continuous fuel conditions that will cumulatively maintain desirable oak densities when followed by previously approved prescribed fire.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects to sandhill onsite trees would be similar to alternative B except fewer acres would be treated.

Alternative D - No Herbicide
This alternative would be the same as alternative B because no herbicide treatments are planned for sandhill or upland pine habitats in this project.

Sensitive Animal Species

Table 11. The conceptual relationship between analysis and findings for Sensitive species is as follows:

	Type of Effects Identified	Corresponding Determination of Effect
1.	No effects	"No impacts"
2.	Beneficial effects	"Beneficial impacts"
3.	Adverse effects (one of these two determinations, depending on extent of adverse effects)	"May impact individuals but not likely to cause a trend to federal listing or a loss of viability" or "Likely to result in a trend to listing or a loss of viability"

Rafinesque's Big-eared Bat

Rafinesque's big-eared bat's range extends from southern Virginia, West Virginia, Ohio, Indiana, and Illinois south to Florida (primarily the panhandle and northern and central portions of the peninsula) and the Gulf of Mexico; west to Louisiana, Arkansas, eastern Oklahoma, and the eastern edge of Texas (NatureServe 2013). Habitat consists mainly of forested communites, particularly those associated with floodplans, supporting large, hollow trees used for roosting. This species also ultilizes flatwoods and mixed oak-pine forests, and can be found roosting in old

buildings and culverts. Threats to this species include removal of large, hollow trees, and clear-cutting (Hipes and others 2001).

Alternative A - No Action
No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area.

Cumulative Effects
There are no cumulative effects expected under this alternative because no actions would take place.

Determination of Effect
Alternative A would have **no impacts** on this species because there would be no effects.

Alternative B – Proposed Action (Preferred Alternative)
The primary direct threat to this species would be loss of roosting habitat.This species primarily roosts in hollow trees in floodplains, but will also utilize flatwoods and mixed forests. Potential roost trees in the uplands may be lost as a result of implementing the proposed action. However, there would still be roost trees available in the floodplain and swamps so viability of this species would not be threatened. Thinning, girdling, and using herbicide to reduce shrubby vegetation would have beneficial indirect effects by opening up the canopy and increasing herbaceous groundcover. Increasing herbaceous groundcover would also increase insect populations resulting in improved foraging conditions. Implementing the proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Cumulative Effects
This alternative when combined with prescribed burning would have beneficial effects on foraging habitat. Thinning, girdling, and herbicide application would open up the canopy allowing more sulight to reach the understory stimulating herbacouse groundcover. Prescribed burning would then maintain herbaceous groundcover.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in Alternative B except fewer acres would be treated. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Alternative D - No Herbicide
This alternative is similar to alternative B but no herbicides would be used. This alternative may not have as great an impact on reducing the woody vegetation without the use of herbicide. While mechanical midstory removal would reduce midstory vegetation initially, hardwood vegetation is likely to re-sprout from the roots. Implementing alternative D may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Cumulative Effects
Cumulative Effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve foraging habitat for this species. Opening up the pine canopy and improving herbacious groundcover would improve conditions for the rafinesque's big-eared bat's prey. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

Gopher Tortoise

This species ranges in the Southeastern United States from southern South Carolina through southern Georgia to southern Florida (excluding most of inland southern Florida), west through southern Alabama and southeastern Mississippi to eastern Louisiana. It occurs on islands off the Gulf coast of Florida as far south as Cape Sable. This species commonly occupies habitats with a well-drained sandy substrate, ample herbaceous vegetation for food, and sunlit areas for nesting. These habitat types include sandhill (pine-turkey oak), sand pine scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood-pine communities. It prefers open habitats that support a wide variety of herbaceous ground cover vegetation for forage; usually abandons densely canopied areas and frequently can be found in disturbed habitats such as roadsides, fence-rows, old fields, and the edges of overgrown uplands (NatureServe 2013). Gopher tortoises excavate deep burrows for refuge from predators, weather, and fire. More than 300 species of animals have been recorded sharing these borrows. Much of its native habitat has been lost to agriculture, citriculture, forestry, mining, urban development, and residential development. Although protected populations occur on public land, the recent development of severe respiratory disease threatens those populations (Hipes and others 2001).

Alternative A - No Action
No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area. Alternative A would have no impacts on gopher tortoises because there would be no new management actions implemented in the analysis area.

Cumulative Effects
There are no cumulative effects expected under this alternative. Prescribed burning would continue and gradualy improve habitat in some areas and maintain the existing conditions in others. However, substantial habitat improvement is not expected. Without the removal of midstory and over abundant overstory vegetation in dense stands, herbaceous vegetation is not likely to receive enough sunlight to become abundant.

Alternative B – Proposed Action (Preferred Alternative)
Gopher tortoises and burrows may be encountered in compartment 28 where xeric habitat is present. Skid trails and log landings would be placed at least 25 feet away from gopher tortoise burrows, and equipment operators would be instructed to maintain a 25-foot distance from them as well. Even with these measures in place to avoid burrows some could be crushed. However, a study conducted by the Army Corps of Engineers showed that tortoises usually excavate collapsed burrows and are not injured by the burrow collapse (Medonca and others 2007).

Thinning and longleaf conversion would have beneficial indirect effects for gopher tortoises. Timber removal would allow more sunlight to reach the ground in turn causing the herbaceous ground cover to increase. Converting some stands to longleaf pine would also be beneficial to gopher tortoises. Longleaf needles provide fine fuel which carries fire across the landscape. Fire stimulates herbaceous vegetation which in turn provides more forage for gopher tortoises.

The direct effects of herbicide on gopher tortoises are unknown. These animals could be subject to exposure. They may move into the areas on drier sites to take advantage of any flush of herbaceous vegetation that might occur and may still be present when herbicides are applied. Reminding contractors to never spray or harass wildlife of any kind and to move away when wildlife is encountered would reduce chances of exposure. It is unlikely that tortoises would ingest enough treated vegetation to be affected because the proposed herbicide triclopyr would not be intentionally sprayed directly on forage vegetation. These herbicides would be used to remove hardwood vegetation which out competes herbaceous vegetation, gopher tortoises primary food source, for nutrients and sunlight. The use of herbicides when combined with other activities, is likely to improve habitat conditions in the project area. In summary, the proposed action may impact individuals, but is not likely to cause a trend to federal listing or a loss of viability of gopher tortoises. Implementing alternative B may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Cumulative Effects
Cumulative Effects of the proposed action are expected to be beneficial. Implementation of the proposed action combined with frequent application of prescribed burning would improve gopher tortoise habitat.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in alternative B except fewer acres would be treated. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Alternative D - No Herbicide
This alternative is similar to alternative B but no herbicides would be used. This alternative may not have as great an impact on reducing the woody vegetation without the use of herbicide. While mechanical midstory removal would reduce midstory vegetation initially, woody vegetation is likely to re-sprout from the roots. Implementing alternative D may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of gopher tortoises because effects would be minimal.

Cumulative Effects
Cumulative effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve gopher tortoise habitat. Opening up the pine canopy and improving herbacious groundcover would improve conditions for gopher tortoises. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional

mechanical treatments and prescribed burns may be needed to kill undesired wood vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

Florida Black Bear

Historically, black bears ranged throughout the southeastern United States with the Florida subspecies inhabiting all of Florida (except the lower Keys) and southern portions of Georgia and Alabama. The distribution of the subspecies, however, has been significantly reduced and fragmented to one subpopulation each in Alabama and Georgia, and in Florida to seven subpopulations. Habitat selection by bears is a function of nutritional needs and spatially fluctuating food sources. The Florida black bear thrives in habitats that provide an annual supply of seasonally available foods, secluded areas for denning, and some degree of protection from humans. Bears are opportunistic foragers, taking advantage of seasonally available fruits, nuts, insects, and human supplied foods such as garbage and domestic animal feed. Known mortality of adult bears is caused largely by humans (i.e., vehicle collisions, illegal kill, and euthanasia). In highly fragmented habitat, bears have more frequent interactions with humans and human-related sources of mortality can be significant. Bears establish home ranges based of food availability, subpopulation density, reproductive status, as well as human influences such as habitat fragmentation. Ranges for females are approximately 1,000 to 4,000 acres. Male black bears establish home ranges in relation to presence of females and are usually 3 to 8 times larger than females' home ranges (FWC2012).

Alternative A - No Action
No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area. Alternative A would have no impacts on Florida black bears because there would be no effects from management activities.

Cumulative Effects
There are no cumulative effects expected under this alternative. Prescribed burning would continue and gradualy improve habitat in some areas and maintain the existing conditions in others. However, substantial habitat improvement is not expected. Without the removal of over abundant overstory vegetation in dense stands, herbaceous vegetation is not likely to receive enough sunlight to become abundant.

Alternative B - Proposed Action (Preferred Alternative)
This project is likely not large enough to have much of an impact on the black bear population or its habitat. It is unlikely that black bears would be directly affected by the proposed action because they are likely to move from the project area while work is taking place. A shift in home range use may occur while treatments are ongoing, but individuals would likely return once treatments are completed. At the proposed rate of application of herbicides it is unlikely that a black bear would ingest enough treated vegetation to be harmed. In summary, the proposed action may impact individuals, but is not likely to cause a trend to federal listing or a loss of viability for Florida black bears.

Cumulative Effects
Viability of this species in the project area would not be threatened because effects would be

minimal when combined with past and future management activities. Prescribed burning when combined with the proposed action would increase herbaceous groundcover. However, black bears are generalists and use a variety of habitats so improved herbaceous understory is not likely to have a measurable effect on black bear populations in the analysis area. Implementing alternative B may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in alternative B except fewer acres would be treated.

Alternative D - No Herbicide
Alternative D would have similar effects to alternative B but without the herbicide effects. Implementing alternative D may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida black bears because effects would be minimal.

Cumulative Effects
Viability of this species in the project area would not be threatened because effects would be minimal when combined with past and future management activities.

Apalachicola Kingsnake

This species is only known to occur in the Big Bend region of the Florida Panhandle south of Telogia Creek between the Apalachicola and Ochlockonee Rivers. This species is mainly found in flatwoods along wetland (bayheads, creek swamps, acid bogs, savannas, roadside ditches, dwarf cypress stands, and evergreen shrub communities) edges. The main threat to this species is over collection for the pet trade (NatureServe 2013).

Alternative A - No Action
No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area. Alternative A is expected to have no impacts to Apalachicola kingsnakes.

Cumulative Effects
No cumulative effects are expected under this alternative. Prescribed fire could restore herbaceous groundcover to ecotonal areas between the flatwoods and wetland habitats, but the absence of fine fuels in these areas may cause fires to go out before they can burn through the ecotone, this species primary habitat. Habitat conditions are expected to remain the same under this alternative.

Alternative B - Proposed Action (Preferred Alternative)
The proposed action is expected to have minimal direct and indirect effects on this species. Heavy equipment used for timber harvest and mechanical woody vegetation treatment along with the presence of snake fearing/hating people would be the potential threats from implementing the proposed action. Contractors would be advised of their responsibility to avoid harming any animals, including snakes. It is highly unlikely that these snakes would be exposed to herbicide

use and even if they were present the likelihood of toxicity to them is negligible. This species primarily utilizes wetland edges which would be minimally impacted by this alternative. Habitat conditions are expected to show little change. In summary the proposed action may impact individuals but is not likely to cause a trend towards federal listing of Apalachicola kingsnakes because effects created under alternative B would be minimal.

Cumulative Effects
This alternative when combined with past, present, and future forest activities is expected to have slightly beneficial effects for Apalachicola kingsnakes. Thinning, longleaf conversion, and herbicide treatments when combined with prescribed burning would improve the herbaceous cover of the uplands. This would provide a continuous fine fuel source for prescribed fire to burn up to the wetland edge improving herbaceous conditions in the ecotone. Improved herbaceous groundcover would improve forage for kingsnake prey which would then improve forage for kingsnakes.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in alternative B except fewer acres would be treated. In summary implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Alternative D - No Herbicide
Alternative D would have similar effects to alternative B but without the herbicide effects. Multiple mechanical treatments may be needed to kill undesirable vegetation because mechanical treatments mainly only top kills vegetation. Implementing alternative D may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Apalachicola kingsnakes because effects would be minimal.

Cumulative Effects
Cumulative effects are expected to be similar to alternative B except mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation.

Florida Pine Snake

The Florida pine snake occurs throughout the state, excluding the Florida Keys, The Everglades, extreme southwestern Florida, and immediately north of Lake Okeechobee. Outside of Florida, it occurs in southwestern and eastern Georgia to southern South Carolina. The Florida Pine Snake requires dry sandy soils for burrowing. It is found most often in open pine-turkey oak woodlands and abandoned fields, and also in scrub, sandhills, and longleaf pine forest. The Florida Pine Snake feeds primarily on pocket gophers, which it pursues by forcing its way into their underground burrows. Other small mammals, lizards, and reptile eggs are also eaten. It may occasionally climb trees in search of birds and their nests. Florida Pine Snakes spend most of their time underground in pocket gopher or gopher tortoise burrows. (NatureServe 2013) Threats to this species include collection for pets, highway mortality, habitat loss and fragmentation caused by development, intensive agriculture, and mining (Hipes and others 2001).

Alternative A - No Action
This alternative would have no impacts on pine snakes because no action would take place. Alternative A would have no impacts on Florida pine snakes because there would be no effects.

Cumulative Effects
Under the no action alternative cumulative effects are expected to be non-existent. Current and future forest service activities are not expected to make noticeable habitat changes.

Alternative B – Proposed Action (Preferred Alternative)
Heavy equipment used for timber harvest and mechanical woody vegetation treatment along with the human interaction would be the potential threats from this proposal. Contractors would be advised of their responsibility to avoid harming any animals, including snakes. It is highly unlikely that these snakes would be exposed to herbicide use, and even if they were present the likelihood of toxicity to them is low. In summary the proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida pine snake because effects would be minimal.

Cumulative Effects
Cumulative effects from this alternative are expected to be beneficial. The proposed action combined with prescribed burning is likely to improve habitat for pine snake prey in turn providing better habitat for pine snakes. Woody vegetation reduction and pine thinning would allow sunlight to increase stimulating herbaceous groundcover. Prescribed burning would further stimulate groundcover by putting nutrients back into the soil through ash. More abundant herbaceous layers supply more roots and bulbs from pocket gophers, pine snakes primary food source. Improving habitat for pine snake prey would improve habitat conditions for pine snakes as well.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in alternative B except fewer acres would be treated. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

Alternative D - No Herbicide
Alternative D would have similar effects to Alternative B but without the herbicide effects. Multiple mechanical treatments may be needed to kill undesirable vegetation because mechanical treatments only top kill vegetation. Implementing alternative D may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida pine snake because effects would be minimal.

Cumulative Effects
Cumulative effects are expected to be similar to alternative B except mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation.

Bachman's Sparrow

In addition to designation as sensitive species, Bachman's sparrow is also a Management Indicator Species for several habitat types that occur in the Beasley Pond Analysis Area. The effects of the alternatives on Bachman's sparrow are described above in that section.

Sensitive Plant Species

The ANF's sensitive species list was revised as of January 1, 2002 and 35 plants were added. Still, little is known about the distribution of many of these species other than general county and state occurrence information gained from NatureServe. FNAI does not track the majority of these species and there are no element of occurrence records for the ANF. In order to better understand and evaluate potential impacts to sensitive plants we determined through literature searches, the primary community type each plant would occur in. Rather than address each plant individually, the potential impacts on the community in which they occur is discussed.

Sandhills, flatwoods, wet prairie, and wetland (stringer, cypress ponds, and swamps) were determined to be the "affected community types". Eighty-three (83) sensitive plant species occupy these habitats. A list of individual species by community type can be found in Appendix A. The remaining plant species, those that occur in the other community types, were eliminated from further analysis because they would not be affected by any of the alternatives.

Alternative A - No Action
Alternative A would see no pine thinnings in the analysis area. The opportunity would be lost at this time to open the canopy and begin to restore the native wiregrass community. Vegetative changes would be limited to those resulting from natural phenomena and prescribed burning. Reduction of intact, contiguous ground fuels coupled with the invasion of hardwood shrubs has lessened the impact of fire as a force on this landscape. Overly dense plantations would be left to thin under natural processes. Those portions of stands experiencing initial crown closure would likely grow darker and denser, effectively shading out the herbaceous groundcover component and moving further away from suitable sensitive plant habitat. Native groundcover species would continue to lose vigor and may over time vanish. This alternative would eventually lead the affected area away from the desired native fire climax community. In summary alternative A may affect sensitive plants but is not likely to cause a trend toward federal listing.

Cumulative Effects
Under this alternative no cumulative effects area expected because no actions would take place. Prescribed burning and natural phenomena would continue to be the only mechanisms for vegetative change within the project area.

Alternative B - Proposed Action (Preferred Alternative)
Moving heavy equipment (feller/bunchers) and skidding trees across the ground would directly affect vegetation, including any sensitive plant species that may be present. These impacts tend to be concentrated on skid trails, log landings, and in isolated shallow wet areas. Individual sensitive plants located in these sites or in the paths of equipment may be crushed, broken, uprooted, or buried. Most perennial species can be expected to survive top kill but are likely to die if uprooted. Loss of individual sensitive plants may occur.

Thinning would lessen the effects and appearance of intensive forestry practices by reducing the number of trees per acre and minimizing the row effect. To some extent it can mimic the natural stand conditions by opening the canopy and increasing the amount of light that reaches the forest floor. This is especially important in the densely planted, overstocked stands present in the analysis area. All sensitive plants under consideration are dependent upon high light conditions and would immediately benefit from the increased sunlight. It is anticipated that thinning would open stands up enough to encourage dormant rhizome and seed banks to respond. The remaining trees would continue to provide needle cast, providing fine fuels to carry fire.

Experience has shown that thinning, in concert with frequent prescribed burning, leads to open pine stands that can provide good habitat for sensitive plants. Prescribed burning helps restore fire dependent plant species in stands that have lacked frequent fire. Together, the reduction in tree density and prescribed fire can be expected to help restore and improve the understory plant community. Areas with intact, contiguous groundcover would have the greatest responses. Although individuals may be lost, the overall habitat would be improved and populations could increase as a result.

Herbicide Application

Triclopyr: This herbicide is semi-selective and especially useful for broad-leaf herbs and woody species. Grasses are generally tolerant and pines are tolerant of the amine formulation after resting buds are formed in late summer. The active ingredient is readily absorbed by foliage, with some stem uptake. It translocates up and down in plants, accumulating in growing tissues and the root collar. Triclopyr is not soil active and is generally non-mobile in soils. This herbicide has a moderately low half-life in soil of 10-46 days (average 30 days) and is degraded by both soil microbes and photolysis. Triclopyr amine is used as an injection or cut-surface treatment in site preparation and release, and as a foliar spray in rights-of-way or for hardwood control in conifer plantations (SERA 2011).

Impacts to sensitive plants from herbicides include direct or indirect deposition from unintentional spraying, spray drift, or contaminated water/soil movement. If sprayed accidentally at the low application rates used by the Forest Service, non-target vegetation could be damaged. Selective application methods (soil spot treatments and direct application to target vegetation) would be employed to minimize potential adverse effects. Overall impacts of treatment with selective herbicides would vary depending on how closely the target and non-target plant species are related, as well as the rate of application.

Planting pine seedlings

Planting pine seedlings would likely have no impact on sensitive plant species.

Nutrient removal and redistribution

Harvest and removal of trees would extract nutrients from the affected area. Standard measures reduce this effect by requiring branches and tops of harvested trees, which contain the majority of nutrients found in the tree, be left on-site and scattered. In thinned stands, most of these nutrients would be quickly taken up and immobilized by residual trees and understory

vegetation. Harvest and removal of the tree boles would have a minor impact on nutrient reserves temporarily reducing soil productivity. A short-term increase in nutrient leaching would also occur following harvesting, however many of the nutrients released from the branches and tops of harvested trees would quickly be taken up and immobilized by residual vegetation. Natural inputs of nutrients from soil weathering, precipitation and dust fall would eventually replace lost nutrients and no long-term decrease in productivity should occur.

Harvest activities would not only remove limited nutrients, they would also cause some redistribution of nutrients within the cutting units. The scattering of branches and treetops would not be uniform and would create an increase in nutrients in some areas and a corresponding decrease in others. Redistribution of nutrients would have micro-site impacts to soil productivity, both positive and negative, but would not affect the over-all productivity of the project area.

Transportation

Old aerial photographs of the forest indicate that most of the roadbeds visible today were already in place some time ago. These roadbeds have stabilized and the ditches have re-vegetated. Culverts and swales will be maintained. No new road beds would be created as a result of this project. There is no unacceptable erosion or sedimentation occurring from the existing roadbeds within the project area that might impact sensitive plants.

Transportation of logs along temporary roads may impact sensitive plants. Individual sensitive plants located in the temporary road or in the paths of equipment may be crushed, broken, uprooted, or buried. Most perennial species can be expected to survive top kill but are likely to die if uprooted. Loss of individual sensitive plants may occur. These temporary haul routes would not cross sensitive or erosion-prone areas and will be closed following the harvest. The local climate and seed bank would promote rapid regeneration of pioneer species into these temporary roadways stabilizing the soil.

Maintenance and re-construction of existing roadways would have minimal impacts on sensitive plant species. These activities would take place in existing roads used by the public so there would be no increased threat of invasive species introduction. Some individual plants may be crushed, broken, uprooted, or buried due to these activities. However, most of the species present along these existing roads would be resilient to disturbance because of current habitat conditions and would be expected to recover.

In summary the proposed action may affect sensitive plants but is not likely to cause a trend towards federal listing.

Cumulative Effects

Experience has shown that thinning and herbicide application, in concert with frequent prescribed burning, leads to open pine stands that can provide good habitat for sensitive plants. Prescribed burning helps restore fire dependent plant species in stands that have lacked frequent fire. Together, the reduction in pine and hardwood density and prescribed fire can be expected to help restore the understory plant community. Areas with intact, contiguous groundcover would have the greatest responses. Although individuals may be lost, the overall habitat would be

improved and populations could increase as a result.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct, indirect, and cumulative effects would be similar to those in alternative B except fewer acres would be treated. Alternative C may affect sensitive plants but is not likely to cause a trend towards federal listing.

Alternative D - No Herbicide
The primary difference between this alternative and alternative B would be that herbicide would not be used. The immediate impacts would be the same as alternative B with no potential effects from herbicide application. However, long-term shrub reduction and habitat improvement would likely be more effective with the use of herbicides. Implementing alternative D may affect sensitive plants but is not likely to cause a trend towards federal listing.

Cumulative Effects
Cumulative Effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve sensitive plant habitat. Opening up the pine canopy and improving herbaceous groundcover would improve conditions for these species. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

Table 12. Summary of the sensitive and proposed species effects determinations for the Beasley Pond Analysis Area January 2015

Species or Species Group	Alternative A	Alternative B	Alternative C	Alternative D
Sensitive aquatic animals and animals that use aquatic habitats	No Impact	No Impact	No Impact	No Impact
Apalachicola Kingsnake	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Florida Pine Snake	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Florida Black Bear	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Bachman's Sparrow	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Gopher tortoise	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Striped newt	No Impact	No Impact	No Impact	No Impact
Rafinesque big-eared bat	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
One-toed amphiuma	No Impact	No Impact	No Impact	No Impact
Bald Eagle	No Impact	No Impact	No Impact	No Impact
Apalachicola Dusky Salamander	No Impact	No Impact	No Impact	No Impact
Arogos skipper	No Impact	No Impact	No Impact	No Impact
Dragonfly species	No Impact	No Impact	No Impact	No Impact

Species or Species Group	Alternative A	Alternative B	Alternative C	Alternative D
Aquatic sensitive species	No Impact	No Impact	No Impact	No Impact
Sandhills	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Mesic-Wet Flatwoods	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Strands, Cypress Ponds, Swamps	No Impact	May impact indv.	May Impact Indv.	May Impact Indv.
Savannas, Bogs, Seepage Slopes	No Impact	May Impact Indv.	May Impact Indv.	May Impact Indv.
Pond, Lake Margins	No Impact	No Impact	No Impact	No Impact
Aquatic	No Impact	No Impact	No Impact	No Impact
Slope, Hardwood Forest	No Impact	No Impact	No Impact	No Impact
Bluffs	No Impact	No Impact	No Impact	No Impact
River/Streambanks	No Impact	No Impact	No Impact	No Impact
Floodplains	No Impact	No Impact	No Impact	No Impact

Socio-economic Environment

Transportation System

Affected Environment

The Transportation Plan for the Beasley Pond Analysis Area includes roads in compartments 25, 26, 27, and 28. There are approximately 53.82 miles of system and non-system roads in these compartments. The roads are maintained at several different maintenance levels described in the table below. The main travel arteries are graded forest roads. Most of the maintenance level 1 and 2 roads that provide back-country access to the public are of a native surface material and require high clearance vehicles. These "woods roads" are only maintained if a problem such as erosion occurs.

Table 13. Breakdown of Maintenance Level Roads

Description	Road Maintenance Level	Miles	Used During Sale
High Degree of User Comfort	5	5.36	5.36
Moderate Degree of User Comfort	4	4.12	4.12
Suitable for Passenger Cars	3	12.93	12.93
High Clearance Vehicles	2	9.24	8.0
Basic Custodial Care (Closed)	1	7.68	6.38
Non-system – Administrative Use Only	NA	14.49	4.7

Total	**53.82**	**41.49**

During Fiscal Year 2007, the Apalachicola National Forest conducted a road analysis review of the transportation system for the forest. This review produced two GIS road coverages for the Apalachicola National Forest. These coverages identified the roads the Forest Service needs to effectively manage the forest. These coverages also identify several roads that the Forest service no longer needs.

In October 2008, the ANF implemented the Decision, modified Alternative D, for Motorized Route Designation. This alternative designates a system of roads and off-highway vehicle (OHV) trails and areas of the forest. Roads open for public use are numbered on the ground. All other roads are closed to the public. OHVs are only allowed on the designated trails. The Forest Service has law enforcement in place to prevent criminal violations, protect all people on the national forest as well as both public and private property, and inform all national forest users of applicable laws and regulations. The Forest Service also participates in cooperative law enforcement agreements with State and local authorities to enforce State and local laws on national forest lands.

Alternative A—No Action
There would be no change to the current transportation system described in Table 7.

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

Alternative B—Proposed Action (Preferred Alternative)
Alternative B would include the use of approximately 4 miles of temporary non-system roads. These roads would only be used to extract timber from established plantation stands and would not be open to general public motorized use.

The proposed action would also include road reconstruction of approximately 13.3 miles and maintenance of 14.7 miles.

Timber harvesting would cause a temporary increase in traffic as a result of hauling timber products. The proposed roadwork would provide better access for public and/or administrative use, while protecting the environment. Temporary log landings would be placed in stands that are to be thinned.

Cumulative Effects
Continued road work would continue to maintain level 2 and 3 roads in the project area. The non-native invasive species control would not have a significant cumulative effect on the transportation system.

Alternative C - Reduced direct impacts on threatened and endangered species
This alternative would have the same effects as Alternative B.

Cumulative Effects
Cumulative effects would be the same as under Alternative B.

Alternative D – No Herbicide
Impacts would similar to those established in Alternatives B and C.

Cumulative Effects
Cumulative effects would be the same as under Alternatives B and C.

Visual Quality

Affected Environment
The Visual Quality Objectives (VQO) of the analysis area range from maximum modification to retention. These designations are based on distances from points of interest, such as developed recreation areas, heavily traveled recreation roads, or wilderness areas. The majority of the Beasley Pond Analysis Area falls within the Maximum Modification classification. In this classification, management activities are dominant and may not appear natural when seen as foreground or middle ground, but they must relate harmoniously to the natural-appearing landscape when viewed as background (from an aerial perspective) (USDA 1999a: 3-155).

Table 14. Visual Quality Assessment

Visual Quality Objective	Acres in Analysis Area	Percent Of Analysis Area
Retention	1203	18%
Partial Retention	1615	24%
Modification	27	<1%
Maximum Modification	3982	58%
Total	6827	100%

Alternative A—No Action
In this alternative, visual quality would only be improved with prescribed burning over the short term. As overstory shading continues grasses and other herbaceous vegetation will be overtaken by more woody species. As these species become dominant the general open like look of the forest will be replaced by dense woody understories, thus reducing the visual quality of the area. The recurrent road maintenance and landline maintenance would have no effect on visual quality in the analysis area.

Cumulative Effects
The forest-wide prescribed burn program would continue to occur and cumulatively affect the visual quality in both the short and long term. Burning would aid in controlling woody shrubs and promoting herbaceous groundcover establishment. Effects would become less effective as canopy closure limits sunlight penetration to the forest floor. Short term impacts include temporary loss of vegetation on the forest floor and charred and burned vegetation.

Alternative B—Proposed Action
The clearcut and associated borrow pit excavation on approximately 16 acres would have the largest impact on the visual quality of the area. Once timber removal operations begin the decline in visual quality will become immediately evident. Bare mineral soil will be present for several years within the borrow pit.

During the timber harvesting operations, some vegetation would be bent over and/or crushed as trees are removed from the stand causing some browning of the vegetation. Treetops and logging slash left in the stand would also turn brown. The following slash treatment zones would be applied.

- *All logging debris within 200 feet of County Road (CR) 379, Forest Road (FR) 379 would be lopped and scattered within 2 feet of the ground.*

These zones would help mitigate the effects of the timber harvesting operations. Harvesting the timber would also open the stands, which would increase the sight distance and increase the chances of wildlife viewing. Wet savanna restoration sites will begin to resemble the open relatively treeless areas once found throughout the area. Wildflowers would begin to bloom abundantly upon wet savanna establishment thereby creating a positive visual quality experience.

When applying herbicides, blue dye would be used to identify treated areas. The blue dye would temporarily detract from the visual appearance. The browning of the targeted vegetation would cure and browning would occur about two to three weeks after the herbicide application for site preparation. The brown leaves would remain on some branches until the winter months.

Cumulative Effects
Prescribed burning in conjunction with Alternative B would result in charred and burned downed debris associated with harvesting operations. These impacts would be short term as logging debris would become consumed with each additional burn. Long term cumulative effects would be beneficial as the project area will begin to resemble historic open park-like forests of northwest Florida.

Alternative C - Reduced direct impacts on threatened and endangered species
Harvesting and woody species control would be slightly less impactful to visual quality under Alternative C than in Alternative B due to the removal of several stands (stands 57 and 54 in compartment 27 and stand 19 in compartment 28). No treatments would occur in those stands under this alternative. The aesthetic quality presently available will remain intact. All other effects from Alternative C on visual quality would be the same as Alternative B.

Alternative D – No Herbicide
The effects from Alternative D would be the same as Alternative B except the browning of vegetation from the use of herbicides would not occur. In clearcut areas that would receive mechanical site preparation the more jagged appearance created by logging equipment would appear more uniform in appearance due to further breaking and spreading of debris.

Cumulative Effects
Cumulative effects would be similar to those in Alternative B.

Recreation

Affected Environment
The recreation opportunities that are available to the public in this analysis area include, but are not limited to, camping, canoeing, hunting, picnicking, recreational driving, and wildlife viewing. Of these recreation uses, hunting and recreational driving are the most common activities. Mud Swamp/New River is the closest roadless area; located southeast of the analysis area. The desired set of experiences offered in or adjacent to these areas are classified as roaded natural or semiprimitive motorized in the Recreation Opportunity Spectrum (ROS). Roaded Natural classification has probability to experience some affiliation with other types of activities more common to the recreation experience but does not imply that management techniques would not be seen or heard. This spectrum is a USDA Forest Service management approach for recognizing possible combinations of recreation activities, settings and probable experience opportunities.

Alternative A – No Action
The no action alternative would allow natural processes to continue, including canopy crown closure and suppression of the groundcover. Without thinning, the young pine plantations would become thicker and more shaded. The recreation experience would decrease over time and the forest composition and character would change to a thick, brushy understory. Hunting and wildlife viewing would also decline as the stands become thicker.

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for recreation.

Alternative B – Proposed Action (Preferred Alternative)
This alternative would temporarily detract from the "natural setting and serenity" of the area. Wet savanna restoration cuts and thinning of the pine over-story would encourage establishment of the groundcover vegetation. Some of the under- and mid-story vegetation would be removed, improving the sight distance. Hunter success would increase with an open under-story and improved access. Temporary detractions of logging equipment could be an off-set to visually appealing. Logging traffic would temporarily increase along major travel arteries.

The proposed treatments may have a temporary adverse effect on the quality of the user's recreational experience in the area of the proposed activities. Wildlife viewing and hunter success may be reduced for 3-6 months due to noise created from the proposed activities.

Cumulative Effects
The forest-wide prescribed burn program will, in conjunction with Alternative B, positively impact recreation in the long term (>1 year) in the project area. Prescribed burning in thinned pine stands will promote herbaceous establishment and growth indicative of historic longleaf wire ecosystems. These systems are diverse in game species and nesting birds species valued by hunters and bird watchers. In the short term logging debris and prescribed burning would reduce aesthetic quality and wildlife viewing opportunities.

Alternative C - Reduced direct impacts on threatened and endangered species
Under this alternative, the effects would be the same as Alternative B.

Cumulative Effects
Cumulative effects under Alternative C are the same as those identified in Alternative B.

Alternative D – No Herbicides
Under this alternative, the effects would be similar to those identified in Alternative B.

Cumulative Effects
Cumulative effects are similar to those identified in Alternatives B and C.

Public Health and Safety

The use of herbicide is often a concern to forest users, workers, and the general public regarding human health and safety.

Alternative A – No Action
No herbicide use is proposed with this alternative. There would be no potential for effects to human health from herbicide use under this alternative.

Cumulative Effects
The forest-wide prescribed burn program will continue to take place in the proposed project area. Short term exposure to smoke and fine particulates will occur locally in burn units. Exposure would last anywhere from a few hours to a day. If herbaceous diversity diminishes in these areas due to over-shading prescribed burning could become more difficult in some areas of the project area.

Alternative B – Proposed Action
This alternative proposes the use of herbicides for woody plant control and site preparation. Due to the short half-lives and fast biodegradability of the proposed products, there is a very low probability of prolonged exposure and risk. The herbicide considered for this project was selected largely for its low toxicity to humans and the environment. There is little risk that the public may unknowingly come into direct contact with treated vegetation as areas will be posted with signs or access otherwise prevented. With the mitigation measures described previously in this document, there is low probability of drift or off-site movement. The label directions place restrictions on wind speed at the time of spraying. Applications will be made close to the ground surface with equipment that produces large size droplets that do not carry far.

Herbicide labeling, which governs the types of uses, disposal, precautions for use, etc., is regulated by the EPA in accordance with FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act of 1947, with numerous additions). Based on tolerances, residue data, and environmental fate, label-use restrictions may be placed on an herbicide label.

Herbicides approved by the EPA would be used. All label requirements would be followed, as required by the EPA. Following the label ensures that the public will not come in contact with herbicide concentrations that may cause harmful effects.

Herbicide applications would be supervised by a Forest Service Certified Pesticide Applicator. This employee would ensure compliance with labeling instructions and safety methods to reduce the risk of accidents.

Risk to public health from herbicide applications has been addressed in a Risk Assessment as part of the VMEIS CP/P (Vol II, Appendix A) and supplemented by the analyses done by Syracuse Environmental Research Associates (SERA 2002, 2003a, 2003b, 2004, 2005, 2011) They document the probable effects on human health (and wildlife) resulting from typical and maximum applications, and accidental spills of herbicide. They analyze the potential for these herbicides to cause toxic effects, cancer, mutations, and birth defects. Based on the Risk Assessment in the VMEIS CP/P, the Regional Forester concluded in the Record of Decision (ROD) for the VMEIS CP/P (p. 12) that application of these herbicides, when applied under the guidelines described, provided greater health protection to workers, the public, and wildlife, than is required by published health and safety standards. Applied under the guidelines, these herbicides do not pose a significant risk to human health. These guidelines are found in Appendix A of the ROD for the VMEIS CP/P.

If label directions are not followed properly, these herbicides could cause eye and skin irritations to workers. The Apalachicola NF uses the lowest rate possible to meet its goals. For a typical application, the use of these chemicals poses a low risk to safety. Under the conditions of typical public exposure to Triclopyr, no member of the public would be affected (VMEIS CP/P, Vol I, p. IV-14). Triclopyr is soluble and does accumulate in human or animal tissue. Human and animal exposure and risk studies conducted for, or cited in, the VMEIS CP/P indicate that cumulative build up effects on human health do not occur when used at prescribed rate with appropriate application methods.

Cumulative Effects
The forest-wide non-native invasive plant species treatment program, forest-wide prescribed fire program and isolated wetland treatment will continue to occur in conjunction with alternative B. The cumulative impacts of herbicide treatment in this alternative along with herbicide treatment for isolated wetland improvement and invasive plant species treatment is not expected to have significant effects on public health and safety in the long term. Short term reductions in air quality may occur when activities are implemented in conjunction with prescribed fire.

Alternative C - Reduced direct impacts on threatened and endangered species
Direct and indirect impacts are similar those found in alternative B, however fewer acres would receive herbicide treatment which reduces the potential for offsite movement of herbicide to waterbodies and non-target plant spray.

Cumulative Effects
Cumulative impacts are similar to alternative B.

Alternative D – No Herbicide
There would be no significant impacts to health and safety under alternative B as woody species control would be accomplished using mechanical tools instead of herbicides.

Cumulative Effects
The forest-wide prescribed fire program, non-native invasive plant species control, and isolated wetlands habitat improve all would occur within and around the analysis area. Smoke from prescribed fire, exhaust/dust from logging operations and woody species control, and herbicide use on invasive plant species could cumulatively reduce air quality in the immediate area in the short term. Impacts as a result of prescribed fire normally last a few hours to a day. Exhaust and dust created during logging and other mechanical equipment usually last a maximum of 1-3 hours after work is completed. Signage will be displayed during both activities to warn the public of the potential health hazards.

Cultural Resources

All stands and roads in the proposal were inventoried for cultural and heritage resources in 2013. To avoid impacting potential sites, the proposed action has been developed to exclude known sites.

Alternative A – No Action
Under this alternative, ongoing forest management activities such as prescribed fire and invasive species treatment will continue to occur. Known cultural sites will be protected during these activities resulting in no significant impacts.

Cumulative Effects
No other past, present or future projects were identified as potentially impacting cultural resources in the analysis area.

Alternative B – Proposed Action (Preferred Alternative)
Activities involving the operation of heavy equipment, such as timber harvesting, road maintenance, and road reconstruction have the greatest potential of all the proposed actions to damage or destroy heritage sites.

Alternative B is not likely to have an effect on cultural or heritage resources because stands to be treated have been surveyed by our forest archeologist. There is still potential to affect undiscovered sites, but this potential is low because stands that had a high probability for cultural resources were intensely surveyed. The following coordination criteria would be set in place to minimize the effect:

- If any heritage resources were discovered during operations all ground-disturbing activity would cease. The Forest Archeologist would determine changes to be made to the project before work would resume (Forestwide Standard & Guide HE-1).
- Known cultural resource sites would be protected by timber sale contract and no ground-disturbing activities would occur in these areas, which may include segments of roads (Forestwide Standard & Guide HE-2).

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

Alternative C - Reduced direct impacts on threatened and endangered species
Effects under alternative C are similar to those identified in Alternative B.

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

Alternative D – No Herbicide

Effects to cultural resources would be similar to those in Alternatives B and C.

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

Economics

Alternative A – No Action
There would be no economic impact under Alternative A. Current management activities such as prescribed burning would continue throughout the area but would not provide an economic benefit to Liberty County.

Cumulative Effects
No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative economic effects.

Alternative B, C, and D
The following table shows the financial analysis of the alternatives. The actual revenue generated by a timber sale would be computed using final cruise data, bid prices, and costs current at the time of the sale. The cost analysis indicates a sale Net Worth of this alternative would be positive.

Timber harvesting activities may result in changes, both positive and negative, to other resources such as wildlife or recreation. These changes can have an associated economic value, but they are often difficult to measure, and are therefore not able to be quantified in this analysis. However, these items would be considered in the decision making process, along with the economics of the sale

Table 15. Beasley Pond Economic Analysis Summary

Base Year	2015
Inflation Rate	0.019

Revenues:				Alternative B		Alternative C		Alternative D	
			Year	Units	Inflated	Units	Inflated	Units	Inflated
Product	Units	Value/Unit	Planned	Planned	Benefits	Planned	Benefits	Planned	Benefits
Sawtimber	CCF	$72.43	2016	17,244	1,272,714	16,315	1,204,148	17,244	1,272,714
Pulpwood	CCF	$32.10	2016	17,351	567,549	15,996	523,228	17,351	567,549
			Total	34,595	1,840,263	32,311	1,727,375	34,595	1,840,263

Costs:				Alternative A		Alternative B		Alternative C	
			Year	Units	Inflated	Units	Inflated	Units	Inflated
Action	Units	Cost/Unit	Planned	Planned	Costs	Planned	Costs	Planned	Costs
Sale Preparation	CCF	$2.00	2015	34,595	69,190	32,311	64,622	34,595	69,190
Road Reconstruction	Miles	$11,675.00	2016	13	154,659	13	154,659	13	154,659
Road Maintenance	Miles	$11,412.00	2016	15	174,432	15	174,432	15	174,432
Temporary Roads	Miles	$11,585.00	2016	5	59,026	5.0	59,026	5.0	59,026
Sale Summary:		Total			457,307		452,739		457,307

Action	Units	Calculation	Alternative A		Alternative B		Alternative C	
Benefits	Dollars	Total Revenues less Roads		1,626,579		1,513,691		1,626,579
Roads and Trails	Dollars	10% Roads and Trails		162,658		151,369		162,658
NFF- Return to Counties	Dollars	25% Revenues		406,645		378,423		406,645
Action Costs	Dollars	Total Costs		69,190		64,622		69,190
Sale Net Worth	Dollars			988,086		919,277		988,086

Environmental justice

Executive Order 12898 requires federal agencies to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (59 FR 32 p. 7629-7635). This project is located in Liberty County, the least populous county in Florida (est. 8,365 in the 2010 census). The racial and economic composition of the county is similar to that for the state of Florida, with no disproportional representation by minority or low income groups protected under the environmental justice executive order. Approximately half of Liberty Co. is covered by the Apalachicola National Forest and forestry activities on national forest and private land are an important part of the local economy. If this project is implemented, it is expected that much of the timber harvest work would be conducted by local businesses, including small and minority businesses. Any contract work implemented for this project will include nondiscrimination clauses consistent with federal laws. As such, there are no environmental justice concerns associated with any of the alternatives in the Beasley Pond Analysis Area. No environmental justice or related civil rights concerns have been raised by the public for this or similar projects on the Apalachicola National Forest.

Comparison of Alternatives

Below is a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects can be distinguished quantitatively or qualitatively among alternatives.

Table 16. Summary of effects

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Modified Wet savanna Treatments)	Alternative D (No Herbicide)
Soils	Some soil displacement will occur as a result of ongoing management activities such as prescribed burning.	Soil displacement and compaction would occur as a result of timber sale operations. Compaction effects are estimated to last several years post-harvest. Soil displacement would be dependent on soil composition with effects being highly localized in stands to be thinned. In wet savanna restoration areas soil displacement could occur heavily if conditions are excessively wet. Herbicide will come into contact with soil under this alternative. Triclopyr is not strongly absorbed in soil. It is readily degraded in soil with a half-life of 10-46 days.	Soil displacement and compaction will occur as a result of timber sale operations. Compaction effects are estimated to last several years post-harvest. Soil displacement would be dependent on soil composition with effects being highly localized in stands to be thinned. In wet savanna restoration areas soil displacement could occur heavily if conditions are excessively wet. Herbicide will come into contact with soil under this alternative. Triclopyr is not strongly absorbed in soil. It is readily degraded in soil with a half-life of 10-46 days.	Soil displacement and compaction will occur as a result of timber sale operations. Compaction effects are estimated to last several years post-harvest. Soil displacement would be dependent on soil composition with effects being highly localized in stands to be thinned. In proposed wet savanna restoration stands herbicide will not come into contact with the soil. Woody species control will be done with mechanical tools.
Water	No change from current conditions.	Improved road drainage and stream crossings would reduce current sedimentation. The herbicide triclopyr could come into contact with open sources of water however herbicide application will be monitored and mitigated to as to not pollute rivers, streams, and aquifers. Triclopyr has a half-life in natural waters of <4 days and is degraded through photolysis. Wet savanna restoration treatments could alter the hydrology locally due to a rise in the water table resulting from tree removal.	Improved road drainage and stream crossings would reduce current sedimentation. The herbicide triclopyr could come into contact with open sources of water however herbicide application will be monitored and mitigated to as to not pollute rivers, streams, and aquifers. Triclopyr has a half-life in natural waters of <4 days and is degraded through photolysis. Wet savanna restoration treatments could alter the hydrology locally due to a rise in the water table resulting from tree removal.	Improved road drainage and stream crossings would reduce current sedimentation. Wet savanna restoration treatments could alter the hydrology locally due to a rise in the water table resulting from tree removal. No herbicides would be used under this alternative. Mechanical woody species control would not affect water quality in the analysis area.
Air Quality	Recurrent road maintenance may temporarily reduce air quality but to a lesser degree than Alt. B and C. Prescribe burning	Logging equipment will produce exhaust and dust in the analysis area but will have no significant impact on short term or long term air quality. Prescribe	Logging equipment will produce exhaust and dust in the analysis area but will have no significant impact on short term or long term air quality.	Logging and mechanical woody species control equipment will produce exhaust and dust in the analysis area but will have no significant

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Modified Wet savanna Treatments)	Alternative D (No Herbicide)
	may have a cumulative effect on all alternatives, particularly when adjoining landowners are administering control burns. Florida's permitting process for prescribed burns would minimize the effects.	burning and road maintenance may have a cumulative effect on all alternatives, particularly when adjoining landowners are administering control burns. Florida's permitting process for prescribed burns would minimize the effects.	Prescribe burning may have a cumulative effect on all alternatives, particularly when adjoining landowners are administering control burns. Florida's permitting process for prescribed burns would minimize the effects.	impact on short term or long term air quality.
PETS (Animals)	Habitat conditions would remain unaltered over the short term. Continued shading of the understory would lead to a proliferation woody plant species over the long term.	Animals may be negatively impacted over the short term due to logging operations. Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres over the long term.	Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres.	Animals may be negatively impacted over the short term due to logging operations. Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres over the long term.
PETS (Plants)	Plant diversity would continue to decline in wet savanna sites as pine encroachment continues. Habitat conditions for species preferring open sunlit longleaf/slash stand conditions would continue to decline gradually.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres over the long term. Individual rare and sensitive plant species may be negatively impacted in the short term due to logging and restoration operations.	No treatments would occur in stands with high concentrations of PETS plant species. Current populations would remain relatively unaffected.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres.
MIS (Animals)	Habitat conditions for MIS animals to remain stable or slightly decline.	Overall habitat conditions would improve over the long term.	Overall habitat conditions would improve over the long term but to a lesser degree than alternative B due to fewer treated acreage.	Overall habitat conditions would improve in the long term. Woody vegetation may respond unfavorably after woody species control using handtools.
MIS (Plants)	Current populations and habitat conditions would remain relatively stable over the short term. Long term conditions would worsen as canopy closure suppresses herbaceous groundcover.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres over the long term. Individual indicator species may be negatively impacted in the short term due to logging and restoration operations.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres over the long term. Individual indicator species may be negatively impacted in the short term due to logging and restoration operations.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres over the long term. Individual indicator species may be negatively impacted in the short term due to logging and restoration operations.
Vegetation	Without thinning, overstocked stands would exhibit growth and continue to shade out herbaceous	Growth rates would increase and conditions for herbaceous ground cover would be improved. Effects would last longer for those areas treated with herbicide	Growth rates would increase and conditions for herbaceous ground cover would be improved. Effects would last longer for those areas treated	Growth rates would increase but conditions for herbaceous ground cover would only be temporarily improved. Effect would be short

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Modified Wet savanna Treatments)	Alternative D (No Herbicide)
	vegetation. Wet savanna sites will continue to be planted over in poor and very poor condition classes. The more open sites would continue to see encroachment of pine species.	and increase chance of survival of Longleaf. Wet savanna restoration areas would begin to resemble the open, generally treeless areas indicative of historic wet savanna sites on the forest. Triclopyr targets woody plants and broadleaf weeds. Non target plant kill may occur due to overspray and drift. It remains active in decaying vegetation for up to 3 months.	with herbicide and increase chance of survival of Longleaf. Wet savanna restoration areas would begin to resemble the open, generally treeless areas indicative of historic wet savanna sites on the forest. Triclopyr targets woody plants and broadleaf weeds. Non target plant kill may occur due to overspray and drift. It remains active in decaying vegetation for up to 3 months.	lived due to re-sprouting woody vegetation after mechanical treatment in wet savanna areas. Repeated treatments would yield long term woody reduction. Groundcover restoration efforts would most likely be delayed until prescribed fire could reduce the hardwood trees and brush through sequential growing season prescribed burns.
Cultural Resources	No impact to cultural resources.	No impact to cultural resources. Mitigation measures will be taken when working around known cultural sites.	No impact to cultural resources. Mitigation measures will be taken when working around known cultural sites.	No impact to cultural resources. Mitigation measures will be taken when working around known cultural sites.
Visual Quality	Lack of treatment would result in overstocked forests outside desired conditions which would gradually reduce visual quality.	Treatment would result in short-term (1-2 years) reduction in visual quality due to vegetation treatments. Herbicide treated areas will contain patches of brown dead woody vegetation. Woody re-sprout will not be as pronounced under this alternative as herbicide application will affect targeted species ability to do so. Long-term conditions (5-10 years) would improve as desired conditions are achieved. For example wildflowers would become abundant in restored wet savanna areas, improving stand aesthetics.	Treatment would result in short-term (1-2 years) reduction in visual quality from vegetation treatments. Herbicide treated areas will contain patches of brown dead woody vegetation. Long-term conditions (5-10 years) would improve as desired conditions are achieved. For example wildflowers would become abundant in restored wet savanna areas thus greatly improving stand aesthetics.	Treatment would result in short-term (1-2 years) reduction in visual quality from vegetation treatments. Short term impacts will not be as pronounced under this alternative due to woody species control being conducted with mechanical tools rather than herbicide. Woody re-sprout will become visible after mechanical treatment. Long-term conditions (10+ years) would improve as desired conditions are achieved. For example wildflowers would become abundant in restored wet savanna areas thus greatly improving stand aesthetics.
Economics	No change from current conditions	This alternative would remove approximately 34,711 CCF of pine products with a slightly positive Net Worth.	This alternative would remove approximately 32,427 CCF of pine products with a slightly positive Net Worth.	This alternative would remove approximately 34,711 CCF of pine products with a slightly positive Net Worth.
Transportation System	Existing interior roads are in moderate to poor condition. No Change in miles available for public access.	Existing interior road conditions would be improved through road reconstruction and maintenance. Public access on the road	Existing interior road conditions would be improved through road reconstruction and maintenance. Public access on the road	Existing interior road conditions would be improved through road reconstruction and maintenance. Public access on the road

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Modified Wet savanna Treatments)	Alternative D (No Herbicide)
		system would remain the same.	system would remain the same.	system would remain the same.
Recreation	Hunting is the primary recreation use in the area. Opportunities would remain about the same over the short term. As groundcover quality and quantity gradually decreases wildlife presence my decrease. This could lead to a decline in hunting success.	Some disruption would occur during the course of the proposed actions. Increased activity in the area may reduce hunting success. Road conditions would be improved and could result in increased use.	Some disruption would occur during the course of the proposed actions. Increased activity in the area may reduce hunting success. Road conditions would be improved and could result in increased use.	Some disruption would occur during the course of the proposed actions. Increased activity in the area may reduce hunting success. Road conditions would be improved and could result in increased use.

Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders."

The Forest Service consulted with the following federal and local agencies while preparing this EIS:

- National Historic Preservation Act for causing ground disturbing actions near historical sites
- U.S. Fish and Wildlife Service and the National Marine Fisheries Service in accordance with the ESA implementing regulations for projects with threatened or endangered species
- Natural Resource Conservation Service for examination of wet savanna soil types within the analysis area.

Chapter 4. Consultation and Coordination

List of Preparers

The Forest Service consulted with the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

Interdisciplinary Team Members

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Outside Agencies

Leroy Crockett, Soil Scientist, Natural Resource Conservation Service
Andrew Williams, Soil Scientist, Natural Resource Conservation Service
Harold Mitchell, U.S. Fish and Wildlife Service
Florida Natural Areas Inventory

List of Agencies, Organizations, and Persons Whom Copies of the Statement Are Sent

This environmental impact statement has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations representing a wide range of views regarding maintaining, improving, and restoring a healthy forest ecosystem.

- Planning and Review Director, Advisory Council on Historic Preservation (ADHP)
- Deputy Director, Animal and Plant Health Inspection Service (APHIS)
- EIS Review Coordinator, Environmental Protection Agency (EPA)
- Regional Director, Federal Aviation Administration (FAA)
- Acquisitions & Serials Branch, National Agricultural Library (NAL)
- National Environmental Coordinator, Natural Resource Conservation Service (NRCS)
- NEPA Coordinator, National Oceanic and Atmospheric Administration (NOAA) Fisheries Service Southeast Region and Office of Policy and Strategic Planning
- U.S. Army Corps of Engineers (USACE)

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Appendix A

APALACHICOLA NATIONAL FOREST PETS PLANTS HABITAT/SPECIES LIST
2002

SAVANNAS, BOGS, SEEPAGE SLOPES

SANDHILLS

Agalinis divaricata
Agrimonia incisa
Baptisia simplicifolia
Berlandiera subacaulis
Calamintha dentata
Euphorbia discoidalis
Galactia microphylla
Paronychia rugelii
Phlox floridana
Physalis arenicola
Pityopsis flexuosa
Polygala leptostachys
Pteroglossapsis (Eulophia) ecristata
Pycnanthemum floridanum
Sisyrinchium xerophyllum
Tephrosia mohrii
Warea sessilifolia

MESIC-WET FLATWOODS

Agalinis divaricata
Angelica dentata
Aristida simpliciflora
Asclepias viridula
Aster chapmanii
Aster eryngiifolius
Baptisia simplicifolia
Cleistes bifaria
Hedeoma graveolens
Hypericum exile
Lachnocaulon engleri
Macbridea alba (Threatened) *****
Nolina atopocarpa
Phlox floridana
Phoebanthus tenuifolia
Pityopsis oligantha
Pteroglossapsis (Eulophia) ecristata
Rhynchospora breviseta
Rudbeckia nitida
Silphium simpsonii
Spiranthes longilabris
Sporobolus curtissii
Sporobolus floridanus
Tridens carolinianus
Xyris drummondii

STRANDS, CYPRESS PONDS, SWAMPS

Carex decomposita
Coreopsis nudata
Hymenocallis henryae
Hypericum chapmanii
Linum westii
Macranthera flammea
Micranthemum glomeratum
Pieris phillyreifolia

Andropogon arctatus
Arnoglossum sulcatum (seeps)
Asclepias viridula
Aster chapmanii
Aster eryngiifolius
Cleistes bifaria
Coreopsis nudata
Gentiana pennelliana
Harperocallis flava (Endangered) *****
Justicia crassifolia
Lachnocaulon digynum
Nyssa ursina
Oxypolis ternata
Parnassia caroliniana
Physostegia godfreyi
Pinguicula ionantha (Threatened) *****
Pinguicula planifolia
Pityopsis oligantha
Platanthrea integra
Polygala hookeri
Rhexia parviflora
Rhynchospora breviseta
Rhynchospora macra
Rudbeckia graminifolia
Ruellia noctiflora
Schoeolirion albiflorum
Scutellaria floridana (Threatened) *****
Sporobolus floridanus
Verbesina chapmanii
Pteroglossapsis (Eulophia) ecristata
Xyris drummondii
Xyris isoetifolia
Xyris louisianica
Xyris scabrifolia

POND.LAKE MARGINS

Lachnocaulon engleri
Rhexia salicifolia (karst)
Rhynchospora pleiantha (karst)
Xyris longisepala (karst)

AQUATIC

Myriophyllum laxum
Najas filifolia

SLOPE/UPLAND HARDWOOD FOREST

Boltonia apalachicolensis
Lythrum curtissii
Magnolia ashei

BLUFFS

Carex baltzellii
Forestiera godfreyi

Pinckneya bracteata
Pinguicula ionantha (Threatened) *
Pinguicula planifolia

FLOODPLAINS
Arnoglossum diversifolium
Carex decomposita
Micranthemum glomeratum
Matelea floridana
Physalis carpenteri
Rhododendron austrinum
Schisandra glabra

RIVER/STREAMBANKS
Aristida patula
Rhynchospora crinipes

* Listed by US Fish and Wildlife as Endangered or Threatened, all others are Sensitive

Apalachicola National Forest PETS Animals
(Subset of the R8 Regional Forester's List dated 08/07/01)

Revised August 7, 2001 effective January 1, 2002.

Common Name	Species	Status
MAMMALS		
Gray Bat	Myotis grisescens	E
Rafinesque's Big-eared Bat	Corynorhinus rafinesquii	S
Round-tailed Muskrat	Neofiber alleni	S
Florida Black Bear	Ursus americanus floridanus	S
BIRDS		
Wood Stork	Mycteria americana	E
Red-cockaded Woodpecker	Picoides borealis	E
Bald Eagle	Haliaeetus leucocephalus	S
Bachman's Sparrow	Aimophila aestivalis	S
REPTILES		
Eastern Indigo Snake	Drymarchon corais couperi	T
Gopher Tortoise	Gopherus polyphemus	P
Apalachicola King Snake	Lampropeltis getulus goini	S
Florida Pine Snake	Pituophis melanoleucus mugitus	S
Suwannee Cooter Turtle	Pseudemys concinna suwanniensis	S
AMPHIBIANS		
Flatwoods Salamander	Ambystoma cingulatum	T
One-toed Amphiuma	Amphiuma pholeter	S
Apalachicola Dusky Salamander	Desmognathus apalachicolae	S
Striped Newt	Notopthalmus perstriatus	P
FISH		
Gulf Sturgeon	Ascipenser oxyryhnchus desotoi	T
Alabama Shad	Alosa alabamae	S
Spotted Bullhead	Ameriurus serracanthus	S
Suwannee Bass	Micropterus notius	S
MOLLUSKS		
Fat Three-Ridge Mussel	Amblema neislerii	E
Shiny-Rayed Pocketbook	Lampsilis subangulata	E
Ochlockonee Moccasinshell	Medionidus simpsonianus	E
Oval Pigtoe	Pleurobema pyriforme	E
Purple Bankclimber Mussel	Elliptoideus sloatianus	T
Florida Arc Mussel	Alasmidonta wrightiana	S
Apalachicola Floater	Anodonta heardi	S

Common Name	Species	Status
Florida Floater	Utterbackia peggyae	S
CRUSTACEANS		
Woodville Cave Crayfish	Procambarus orcinus	S
INSECTS		
Arogos Skipper	Atrytone arogos arogos	S
Say’s Dragonfly	Cordulegaster sayi	S
Belle's Sand Clubtail	Progomphus bellei	S
Calvert's Emerald	Somatochlora calverti	S

Appendix B

Glossary of Forestry Terms

- **age -** the mean age of the trees constituting a forest, crop, or stand —*note* in practice, in even-aged forests, the mean age of dominant and sometimes also codominant trees is taken, and the age of a plantation is generally taken, from the year in which it was formed, i.e., exclusive of the age of the nursery stock then brought to it
- **age class -** One of the intervals into which the age range of trees is divided for classification or use. A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, such as a 10-year age class, as used in inventory or management.
- **analysis area -** a collection of land areas, not necessarily contiguous, sufficiently similar in character that they can be treated as if they were identical —*synonym* management unit, land type, stand type, analysis unit
- **available fuel -** that portion of the total wildland fuel that would actually be consumed under specified burning conditions
- **basal area (of a tree)** - the cross-sectional area of the trunk 4 1/2 feet above the ground; **(per acre)** the sum of the basal areas of the trees on an acre; used as a measure of forest density.
- **best management practices (BMP)** - a practice or usually a combination of practices that are determined by a state or a designated planning agency to be the most effective and practicable means (including technological, economical, and institutional considerations) of controlling point and nonpoint source pollutants at levels compatible with environmental quality goals
- **biomass** - 1. ecology the total dry organic matter at a given time of living organisms of one or more species per unit area (species biomass) or of all the species in the community (community biomass) 2. the living or dead weight of organic matter in a tree, stand, or forest in units such as living or dead weight, wet or dry weight, ash-free weight, etc. 3. harvesting the wood product obtained (usually) from in-woods chipping of all or some portion of trees including limbs, tops, and unmerchantable stems, usually for energy production
- **CCF –** one hundred cubit feet
- **clearcut -** A stand in which essentially all trees have been removed in one operation to produce an even-aged stand. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration (see regeneration method two-aged methods).
    - **patch clearcut** - A harvest that removes essentially all trees in patches at a sub-stand level in two or more entries to produce an even-aged stand where the range of tree ages is less than 20% of the rotation age after harvest of all patches.
    - **stand clearcut** - A harvest that essentially removes all the trees in a stand in one operation.
    - **strip clearcut** - A harvest that removes essentially all trees in strips at a sub-stand level in two or more entries to produce an even-aged stand where the range of tree ages is less than 20% of the rotation age after harvest of all strips.
- **clearcut with reserves -** A variation of the clearcutting regeneration method to produce a two-aged stand in which varying numbers of reserve trees are retained to achieve goals other than regeneration. The reserve trees should generally compromise at least 10% of the growing space of the stand.
- **compartment -** a portion of a forest under one ownership, usually contiguous and composed of a variety of forest stand types, defined for purposes of locational reference and as a basis for forest management
- **crown cover -** the ground area covered by the crowns of trees or woody vegetation as delimited by the vertical projection of crown perimeters and commonly expressed as a percent of total ground area —synonym canopy cover —note crown cover measures the extent to which the crowns of trees are nearing general contact with each other
- **diameter at breast height (DBH) -** the diameter of the stem of a tree measured at breast height (4.5 ft or 1.37 m) from the ground —note 1. on sloping ground the measure is taken from the uphill side —note 2. DBH usually implies diameter outside bark (DOB) but can be measured as inside bark (DIB)

- **ecosystem -** A spatially explicit, relatively homogeneous unit of the earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. An ecosystem is commonly described in terms of its: composition, structure, function and connectivity.
- **evapotranspiration -** the conversion of water, whether surface water, soil moisture (both by evaporation), or within plants (by transpiration) into water vapor that is released to the atmosphere
- **even-aged stand** - A stand of trees composed of a predominately single age class in which the range of tree ages is usually less than 20 percent of rotation.
- **forest -** An ecosystem characterized by more or less dense and extensive tree cover, often consisting of stands varying in characteristics such as species composition, structure, age class, and associated processes, and commonly including meadows, streams, fish and wildlife.
- **group selection regeneration method -** A method of regenerating uneven-aged stands in which trees are cut, in small groups, and new age classes are established. The width of groups is commonly approximately twice the height of the mature trees, with small openings providing microenvironments suitable for tolerant regeneration, and the larger openings providing conditions suitable for more intolerant regeneration. In the group selection regeneration method, the management unit or stand in which regeneration growth and yield are regulated consists of a landscape containing an aggregation of groups.
- **leaching** - the removal of soluble materials from one zone in soil to another via water movement in the profile
- **natural regeneration -** The establishment of a plant or plant age class from natural seeding, sprouting, or suckering.
- **release** - An intermediate treatment designed to free young trees from undesirable, usually overtopping, competing vegetation.
- **perennial stream** - a stream that has running water on a year-round basis under normal climatic conditions
- **plantation** - a stand composed primarily of trees established by planting or artificial seeding
- **prescribed burn** - to deliberately burn wildland fuels in either their natural or their modified state and under specified environmental conditions, which allows the fire to be confined to a predetermined area and produces the fireline intensity and rate of spread required to attain planned resource management objectives —synonym controlled burn, prescribed fire
- **quadratic mean diameter** - the diameter corresponding to their mean basal area
- **roller chopper -** a large cylindrical drum, which may be partially filled with water, with cutting blades mounted parallel to its axis and drawn by a tractor or skidder across a site to break up slash or crush scrubby vegetation prior to (usually) burning and planting
- **seed tree regeneration method -** An even-aged regeneration method in which a new age class develops from seeds that germinate in fully-exposed micro-environments after removal of the previous stand, except for a small number of trees left to provide seed. Any retained trees, referred to as leave trees, should generally comprise less than 10% of the growing space of the stand.
- **silviculture** - The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.
- **silvicultural treatment** - A forest management activity such as thinning, harvesting, planting, pruning, prescribed burning and site preparation that is designed to alter the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis
- **single tree selection** - individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration
- **site index** - a species-specific measure of actual or potential forest productivity (site quality, usually for even-aged stands), expressed in terms of the average height of trees included in a specified stand component (defined as a certain number of dominants, codominants, or the largest and tallest trees per unit area) at a specified index or base age
- **stand** - A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the fundamental unit of silviculture reporting and record-keeping. Stand may be analogous to Activity Unit
- **stand improvement** - an intermediate treatment made to improve the composition, structure, condition, health, and growth of even

- **thinning** - An intermediate treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality. Includes crown thinning (thinning from above, high thinning), free thinning, low thinning (thinning from below), mechanical thinning (geometric thinning), and selection thinning (dominant thinning).
- **thin from below** - the removal of trees from the lower crown classes to favor those in the upper crown class
- **uneven-aged silvicultural system** - A planned sequence of treatments designed to regenerate or maintain a stand with three or more age classes. Includes single-tree selection, and group selection regeneration methods.
- **uneven-aged stand** - A stand of trees of three or more distinct age classes, either intimately mixed or in groups.
- **unstocked** - The percent of a forested land area that does not meet forest plan stocking levels due to disturbances such as fire, harvest, wind, insects or diseases.
- **watershed** - a region or land area drained by a single stream, river, or drainage network

Appendix C

R8 FSVeg Tabular - R8 RCW Foraging Report

Date Of Report: **January 14, 2015, 12:48 pm EST**

Reporting Pines only. No Hardwoods.

Found **129** stands in 'FS_NRIS_FSVEG.NRV_R8_FSVEG_STANDS_VM' for Project: **BEPO**, Compartments List: **all**

		Pines							
Measurement Date	**Comp./Stand**	**Pine TPA**	**Pine BA**	**Pine TPA 5" to10"**	**Pine BA 5" to 10"**	**Pine TPA 10" to 14"**	**Pine BA 10" to 14"**	**Pine TPA 14" to 99"**	**Pine BA 14" to 99"**
8/23/2012	250001	134	84	58.2	20	67.2	52	8.6	12
2/21/2013	250002	157.2	112	42.6	16	102.9	80	11.7	16
8/23/2012	250005	205.3	116	116	48	85.6	64	3.6	4
8/23/2012	250005	205.3	116	116	48	85.6	64	3.6	4
1/9/2013	250006	165.8	128	44.8	16	93.1	76	27.8	36
1/31/2013	250007	101	99.2	6.7	2.3	54.5	42.3	39.8	54.6
1/28/2013	250008	89.9	88			49.9	32	40	56
8/14/2012	250009	201.8	126	79.6	30	110.8	82	11.4	14
8/29/2012	250011	207.1	140	50.3	20	134.8	95	22	25
1/9/2013	250012	86.7	81.7	17.6	5	34.9	30	34.2	46.7
8/29/2012	250013	316.4	132	234.8	72	81.6	60		
1/31/2013	250014	465.9	130	458.8	126	7.1	4		
8/23/2012	250015	330.7	115	281.7	85	49	30		

Measurement Date	Comp./Stand	Pine TPA	Pine BA	Pine TPA 5" to10"	Pine BA 5" to 10"	Pine TPA 10" to 14"	Pine BA 10" to 14"	Pine TPA 14" to 99"	Pine BA 14" to 99"
1/8/2013	250016	135.9	56.7	105.5	35	27.5	18.3	2.9	3.3
1/23/2013	250017	92.9	106.7			35.2	30	57.6	76.7
1/14/2013	250018	93.2	92	9.1	4	49.7	44	34.5	44
1/29/2013	250019	157	57.1	126.8	37.1	24.9	14.3	5.3	5.7
7/23/2012	260001	122.1	100	31.1	10	56.9	45	34.1	45
7/23/2012	260002	229.5	130	136.6	60	84.2	60	8.7	10
7/17/2012	260004	223.9	105	166.2	65	57.7	40		
7/23/2012	260005	127.7	115	33	10	52.7	45	42.1	60
7/24/2012	260007	645.4	166.7	627.4	156.7	18	10		
7/24/2012	260008	136.1	98.7	35.4	10.7	84.9	68	15.8	20
8/2/2012	260009	169.8	130	22.1	10	138.5	110	9.1	10
7/23/2012	260010	243	155	61.7	25	169.3	115	12	15
8/2/2012	260011	176.9	113.3	89.5	20	49.5	33.3	37.9	60
7/18/2012	260012	175.2	114.3	58.5	22.9	114	88.6	2.7	2.9
7/20/2012	260013	264.3	130	164	63.3	100.3	66.7		
8/7/2012	260014	196	104	117	32	53.9	40	25	32
7/25/2012	260015	231.7	120	127.4	42.9	96.8	68.6	7.6	8.6
8/1/2012	260016	96	110			44.5	40	51.5	70
8/13/2012	260017	139.7	80	74.4	13.3	40.4	33.3	24.9	33.3
8/9/2012	260018	207.7	146.7	69	26.7	92.5	66.7	46.2	53.3
7/24/2012	260020	145.3	103.3	44.2	20	98.1	80	3	3.3
7/24/2012	260023	155.8	85	95.8	35	51.6	40	8.3	10
8/2/2012	260024	115	80	41.1	13.3	55.3	43.3	18.6	23.3
7/18/2012	260031	323.4	170	189.5	80	133.9	90		
8/2/2012	260033	125.8	83.3	60.3	26.7	50.7	36.7	14.8	20
6/5/2014	260036	79.2	92.5	14.3	5	5.4	5	59.4	82.5
8/2/2012	260037	256.3	120	194.8	66.7	50.1	40	11.4	13.3
7/23/2012	260045	127	100	29.7	10	68.7	52.5	28.5	37.5

Measurement Date	Comp./Stand	Pine TPA	Pine BA	Pine TPA 5" to10"	Pine BA 5" to 10"	Pine TPA 10" to 14"	Pine BA 10" to 14"	Pine TPA 14" to 99"	Pine BA 14" to 99"
2/22/2013	270001	387.1	120	378.1	110	8.8	5	0.1	5
2/21/2012	270002								
5/24/2012	270003	201	123.3	97.9	40	91.9	70	11.1	13.3
5/4/2012	270004	401.1	100	401.1	100				
5/23/2012	270005	171.8	160			123.9	100	47.9	60
2/21/2012	270006	110.7	84	34.6	10	50.3	41	25.8	33
6/18/2012	270007	162.2	110	43.9	10	103.3	80	15	20
6/4/2014	270008	61.7	76.7	9.5	3.3	20.9	13.3	31.2	60
4/17/2012	270009	595.1	160	572.3	146.7	22.8	13.3		
6/18/2012	270010	172	80	134.2	53.3	37.8	26.7		
4/23/2012	270012	175.9	120	59	20	102.6	80	14.4	20
6/14/2012	270013	135.5	86.7	74.7	20	29.6	23.3	31.2	43.3
4/17/2012	270014	76.4	68.9	18.7	6.1	35.2	29.4	22.5	33.3
2/21/2012	270015	542.8	170	526.2	160	16.5	10		
6/12/2012	270016	258.9	83.6	248.4	74.5	10.4	7.3	0	1.8
6/5/2014	270017	79.3	70	20	7.1	29	24.3	30.3	38.6
2/21/2012	270019	388.8	125	380.5	120	8.3	5		
6/4/2014	270020	95.4	71.4	29.3	11.4	45.5	34.3	20.6	25.7
6/12/2012	270021	55.7	66.7			22.3	20	33.4	46.7
6/18/2012	270022	168.4	122.5	60.3	18.3	68.8	54.2	39.3	50
6/11/2012	270023	112.1	102.9	35.3	8.6	30	27.1	46.8	67.1
6/12/2012	270025	147	113.9	48.7	16.5	60	46.1	38.4	51.3
6/5/2012	270026	212.3	148	87.8	28	88.6	72	35.9	48
7/10/2012	270028	221.7	130	119.5	45	83.4	60	18.9	25
8/7/2012	270030	251.5	130	155.5	50	81	60	15	20
6/1/2012	270033	164.2	103.1	78.4	27.7	68.8	52.3	17.1	23.1
6/5/2012	270034	160.4	104.7	64.1	18.8	73.8	57.6	22.5	28.2

Measurement Date	Comp./Stand	Pine TPA	Pine BA	Pine TPA 5" to10"	Pine BA 5" to 10"	Pine TPA 10" to 14"	Pine BA 10" to 14"	Pine TPA 14" to 99"	Pine BA 14" to 99"
5/30/2012	270036	311	85.7	286.4	68.6	24.6	17.1		
7/12/2012	270037	194.5	105	106.6	32.5	62.5	42.5	25.3	30
5/30/2012	270041	108	90	24.2	6.7	54.9	44.4	29	38.9
2/12/2013	270044	253.7	140	136.7	46.7	108.9	83.3	8	10
2/22/2013	270045	149	110	45.9	20	89.9	70	13.2	20
2/22/2013	270046	354.4	100	343.9	90	10.5	10		
2/22/2013	270047	252.5	180	83.1	40	125.5	80	43.9	60
5/23/2012	270048	122.9	126.7	12.1	3.3	55.2	46.7	55.6	76.7
4/23/2012	270049	199.7	116	120.8	48	59.3	44	19.5	24
6/18/2012	270050	220.1	84	167.5	48	52.7	36		
6/1/2012	270052	163.4	102.5	80.8	22.5	56.8	45	25.8	35
5/23/2012	270053	125.1	96	31.7	8	76	68	17.4	20
7/10/2012	270054	147.8	100	66	22.5	64.8	55	17	22.5
6/1/2012	270055	127.3	80	72.3	25	43.1	35	11.8	20
6/18/2012	270056	113.1	100			99.3	80	13.8	20
7/10/2012	270057	237.3	100	135.6	20	83.7	60	17.9	20
9/10/2012	280001	223.8	128	96.5	20	100.5	76	26.9	32
9/4/2012	280004	179.1	96	94	16	50.5	36	34.5	44
9/4/2012	280005	118.7	76	50	10	42.7	34	25.9	32
2/12/2013	280006	219.2	102.9	155.1	54.3	61.5	45.7	2.7	2.9
1/31/2013	280007	83.1	72.7	17.3	7.3	38.4	29.1	27.4	36.4
1/15/2013	280008	208.5	84	126.6	32	74.9	44	7	8
1/9/2013	280009	375.7	107.5	326.2	77.5	49.5	30		
6/5/2014	280012	102.5	70	35.3	12.5	47.9	33.8	19.2	23.8
2/12/2013	280014	87.8	64	35.1	12	33.9	28	18.8	24
1/28/2013	280016	414.9	141.8	384.6	121.8	30.3	20		
6/5/2014	280017	102.9	70	25.2	8	62.6	44	15.1	18

Measurement Date	Comp./Stand	Pine TPA	Pine BA	Pine TPA 5" to10"	Pine BA 5" to 10"	Pine TPA 10" to 14"	Pine BA 10" to 14"	Pine TPA 14" to 99"	Pine BA 14" to 99"
1/28/2013	280018	258	117.5	167.7	55	87.9	60	2.3	2.5
1/31/2013	280019	131.8	96	43.5	14	70.9	58	17.4	24
1/31/2013	280021	80	52.5	39.5	17.5	32.1	25	8.3	10
1/31/2013	280022	98.1	70.9	44.5	16.4	36.2	29.1	17.4	25.5
1/15/2013	280024	264.9	80	231	60	33.9	20		
6/5/2014	280302	95.3	57.5	43	15	37.3	25	15	17.5
6/5/2014	290002	100.4	72	34.9	12	45.4	36	20	24
6/5/2014	290003	95.9	68.3	25.5	6.7	51.9	40	18.5	21.7
6/5/2014	290010	57.3	47.5	16.5	5	21.2	17.5	19.5	25
6/4/2014	290011	80.6	55	25.9	7	41.6	32	13.1	16
6/4/2014	290014	153.2	64	105.6	32	42.8	26	4.8	6
6/4/2014	290017	107.7	56.7	61.1	18.3	36.8	26.7	9.8	11.7
6/4/2014	290026	72.2	60	12.7	2.5	37.6	30	21.8	27.5
6/4/2014	290047	74.5	35	49.9	15	20.6	15	3.9	5
6/5/2014	290058	75.9	60	13.8	2.5	42.1	32.5	20	25
***TPA = Trees per acre**	***BA = Basal Area**								
These results include only **Live Trees > 5.0"** and do not include **Off Plot trees**.									
All trees that have a DBH are included.									

Response to Public Comment (for Final EISs only)

[Insert responses to public comment.]